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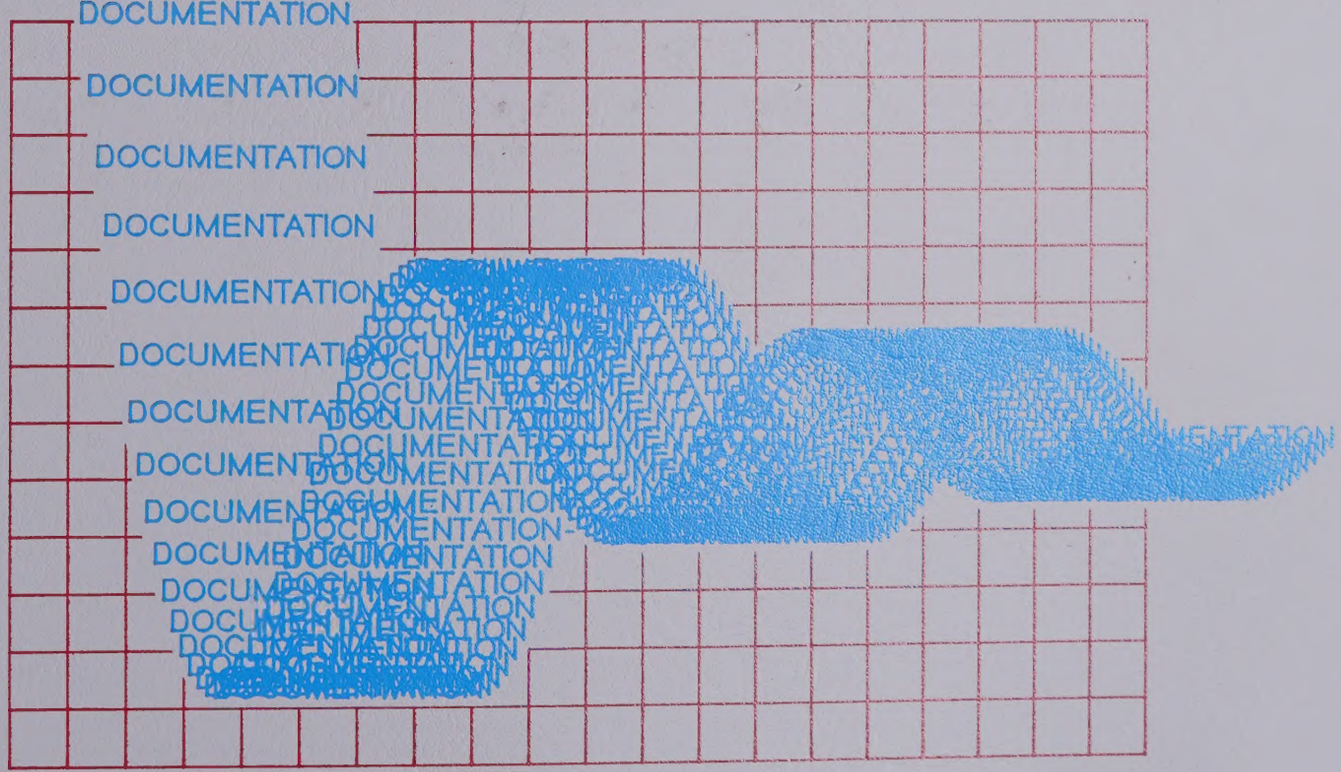

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ROHDE&SCHWARZ

Test and Measurement
Division

Service Manual Instrument

Universal Radio Communication Tester

CMU200

1110.0008.02

Printed in the Federal
Republic of Germany

Tabbed Divider Overview

Spare Parts Express Service
List of R&S Representatives
Safety Instructions

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Contents of Manuals for Universal Radio Communication Tester CMU

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In case of urgent spare parts requirements for this Rohde & Schwarz unit, please contact our spare parts express service.

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ISO 9001

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Safety Instructions

This unit has been designed and tested in accordance with the EC Certificate of Conformity and has left the manufacturer's plant in a condition fully complying with safety standards.

To maintain this condition and to ensure safe operation, the user must observe all instructions and warnings given in this operating manual.

Safety-related symbols used on equipment and documentation from R&S:

Observe operating instructions

Weight indication for units >18 kg

PE terminal

Ground terminal

Danger! Shock hazard

Warning! Hot surfaces

Ground

Attention! Electrostatic sensitive devices require special care

1. The unit may be used only in the operating conditions and positions specified by the manufacturer. Unless otherwise agreed, the following applies to R&S products:

   IP degree of protection 2X, Pollution severity 2, overvoltage category 2, altitude max. 2000 m.

   The unit may be operated only from supply networks fused with max. 16 A.

2. For measurements in circuits with voltages V_{rms} > 30 V, suitable measures should be taken to avoid any hazards.

   (using, for example, appropriate measuring equipment, fusing, current limiting, electrical separation, insulation).

3. If the unit is to be permanently wired, the PE terminal of the unit must first be connected to the PE conductor on site before any other connections are made. Installation and cabling of the unit to be performed only by qualified technical personnel.

4. For permanently installed units without built-in fuses, circuit breakers or similar protective devices, the supply circuit must be fused such as to provide suitable protection for the users and equipment.

5. Prior to switching on the unit, it must be ensured that the nominal voltage set on the unit matches the nominal voltage of the AC supply network.

   If a different voltage is to be set, the power fuse of the unit may have to be changed accordingly.

6. Units of protection class I with disconnectible AC supply cable and appliance connector may be operated only from a power socket with earthing contact and with the PE conductor connected.

7. It is not permissible to interrupt the PE conductor intentionally, neither in the incoming cable nor on the unit itself as this may cause the unit to become electrically hazardous.

   Any extension lines or multiple socket outlets used must be checked for compliance with relevant safety standards at regular intervals.

8. If the unit has no power switch for disconnection from the AC supply, the plug of the connecting cable is regarded as the disconnecting device. In such cases it must be ensured that the power plug is easily reachable and accessible at all times (length of connecting cable approx. 2 m). Functional or electronic switches are not suitable for providing disconnection from the AC supply.

   If units without power switches are integrated in racks or systems, a disconnecting device must be provided at system level.

9. Applicable local or national safety regulations and rules for the prevention of accidents must be observed in all work performed.

   Prior to performing any work on the unit or opening the unit, the latter must be disconnected from the supply network.

   Any adjustments, replacements of parts, maintenance or repair may be carried out only by authorized R&S technical personnel.

   Only original parts may be used for replacing parts relevant to safety (eg power switches, power transformers, fuses). A safety test must be performed after each replacement of parts relevant to safety.

   (visual inspection, PE conductor test, insulation-resistance, leakage-current measurement, functional test).

continued overleaf

Safety Instructions

10. Ensure that the connections with information technology equipment comply with IEC950 / EN60950.
11. Lithium batteries must not be exposed to high temperatures or fire.

    Keep batteries away from children.

    If the battery is replaced improperly, there is danger of explosion. Only replace the battery by R&S type (see spare part list).

    Lithium batteries are suitable for environmentally-friendly disposal or specialized recycling. Dispose them into appropriate containers, only.

    Do not short-circuit the battery.
12. Equipment returned or sent in for repair must be packed in the original packing or in packing with electrostatic and mechanical protection.
13. Electrostatics via the connectors may damage the equipment. For the safe handling and operation of the equipment, appropriate measures against electrostatics should be implemented.
14. Any additional safety instructions given in this manual are also to be observed.

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Contents of Manuals for Universal Radio Communication Tester CMU200

Service Manual Instrument

This service manual for Universal Radio Communication Tester CMU provides information on checking the generator for compliance with rated specifications, as well as on adjustment, repair and troubleshooting. It further contains all the information necessary for repairing the generator by the replacement of modules.

The service manual comprises five chapters and an annex (chapter 5) containing the CMU circuit documentation:

Chapter 1 provides all the information necessary to check CMU for compliance with rated specifications. The required test equipment is included, too.

Chapter 2 describes the adjustment of the +5 VDC reference source and of the 10-MHz reference frequency source as well as the software-controlled adjustment of individual module data following module replacement.

Chapter 3 describes the design of CMU as well as simple measures for repair and fault diagnosis, in particular, the replacement of modules and access to hardware settings by means of service commands.

Chapter 4 contains information on the extension and modification of CMU by installing instrument software and retrofitting options.

Chapter 5 contains spare parts lists and exploded views of CMU.

Operating Manual

In the operating manual for CMU basic unit you will find information about the technical specifications of CMU, the controls and connectors on the front and rear panel, necessary steps for putting the instrument into operation, the basic operating concept, manual and remote control.

For introduction typical measurement tasks are explained in detail using the functions of the user interface and program examples.

The operating manual contains all information on the characteristics, putting into operation, operation and remote control of CMU. It further provides hints on preventive maintenance and fault diagnosis by means of warnings and error messages output by the unit.

Service Manual Modules

The service manual modules is not delivered with the instrument but may be obtained from your R&S service department using the order number 1100.4903.92.

Service manual modules contains information about the individual modules of CMU. This comprises the test and adjustment of the modules, fault detection within the modules and the interface description.

Operating Manual CMU-K21/-K22/-K23 (Software Options: GSM900/1800/1900 for CMU-B21)

The operating manual CMU-K21/-K22/-K23 describes the test of GSM mobile phones by means of the CMU and the software options GSM900/1800/1900 for CMU-B21. The structure of the GSM900/1800/1900 operating manual is analogous to the CMU operating manual.

1 Performance Test

This chapter provides the necessary information for checking the technical data of the CMU. Please read the general notes on the test procedure on page 1.7 first. Then follows a list of the measuring equipment required for the performance test; a form for the test report is to be found at the end of this chapter.

The adjustment of the instrument for restoring the data integrity and the measuring equipment required for this purpose will be described in chapter 2 of this service manual.

General

There are the following possibilities for checking the technical data of a CMU instrument:

A) Calibration with Individual Measuring Instruments (Mini ACS) every one year

Advantages

- on-site calibration
- easy to reach
- Automatic procedure
- Small measurement uncertainties
- Calibration and readjustment

Disadvantages

- not all measurements possible

B) Calibration at an R&S Representative with an ACS100 Calibration System every three years

Advantages

- Automatic procedure
- Small measurement uncertainties
- Calibration and readjustment
- In most cases, the instrument does not have to leave the country

C) Sending the Instrument to the Factory (Memmingen, Germany)

Advantages

- Automatic procedure at the final test setup
- Minimal measurement uncertainties
- Calibration and readjustment

Necessary Documents

- Operating manual CMU 200
- Data sheet CMU 200

Note: *It is recommended to read the following journal on the subjects "measurement uncertainty" and "tolerance analysis": ETSI Technical Report ETR 028, June 1997*

Measuring Instruments and Auxiliary Means

Table 1-1Measuring instruments and auxiliary means for manual performance test

Item	Type of instrument	Required characteristics	Appropriate device	R & S order number	Use	Remark
1	Signal generator	100 kHz to 2.7 GHz, Generation of a GSM signal (dummy burst)	SME03 SMIQ	1038.6002.03	RX measure-ments	
2	Spectrum analyzer	100 kHz to 7 GHz, Demodulation of GSM signals	FSE with FSE-B7 FSIQ FSP-3	1066.30.10.20 1066.30.10.30 1066.4317.02 1093.4495.03	TX measure-ments	
3	Power meter		NRVD with sensors NRV-Z4 NRV-Z51		RX measure-ments, TX measure-ments	
4	Power attenuator				RX measure-ments	
5	Power amplifier	100 kHz to 2.7 GHz, Pout=100 W,			RX measure-ments	
6	Harmonics filter	attenuate the harmonics of the power amplifiers to min 30 dBc			RX measure-ments	
7	Directional coupler	100 kHz to 2.7 GHz, up to 100 W			RX measure-ments	
8	Attenuator		RSP	831.3515.02	TX measure-ments	
9	AC voltmeter		URE	350.5315.02	TX measure-ments	
10	Network analyzer	100 kHz to 2.7 GHz	ZVR	1043.0009.61	Reflection coefficient/ VSWR RF connectors	

Test Setups

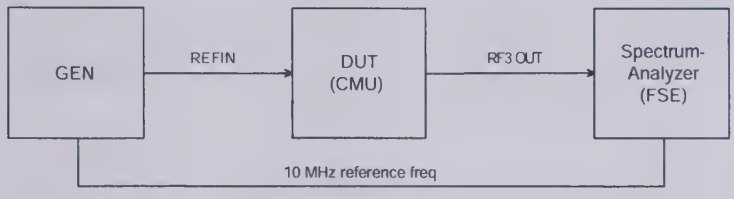
The quality of the test setup has an effect on the measurement procedures.

Note: *Make sure to use only high-quality coax cables and coax connectors as well as calibrated measuring equipment.*

Reference Frequencies

See test setup REF1

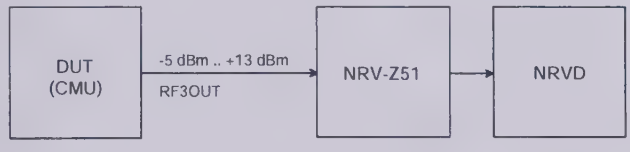
REF1



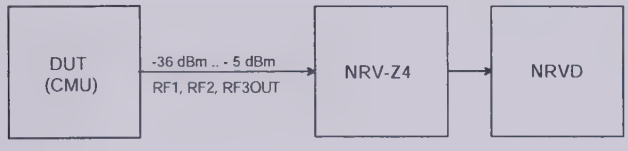
TX Level Measurements

See test setup TX1, TX2, TX3, TX4 (depending on level range)

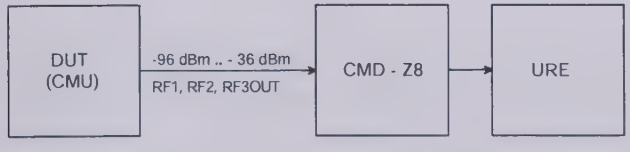
TX1



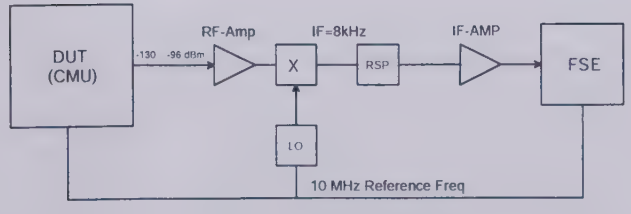
TX2



TX3

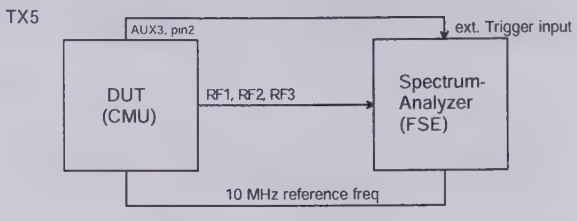


TX4



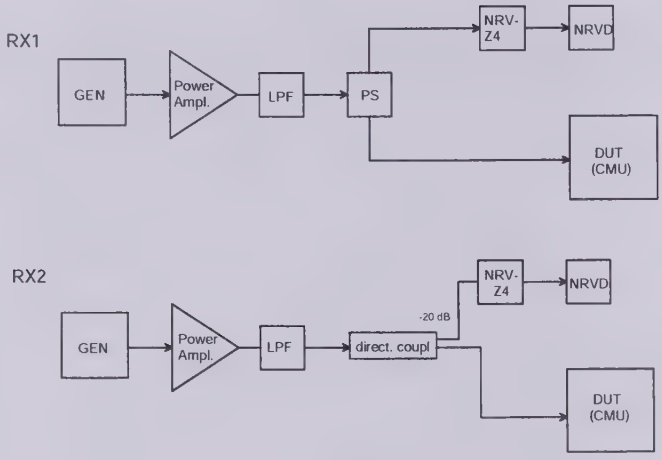
General TX measurements

See test setup TX5



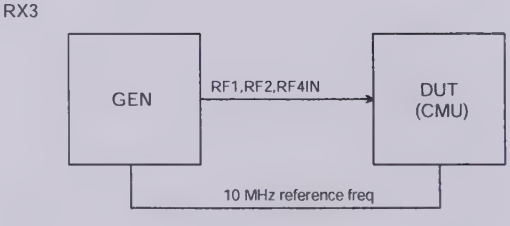
RX Level measurements

See test setup RX1, RX2 (depending on level range)



General RX Measurements

See test setup RX3



Tolerance Analysis

Due to the small measurement uncertainty of the CMU, the measuring equipment must meet stringent requirements. Since the measurement uncertainty of the measuring equipment to be achieved depends on the test setup used, it is recommended to perform a tolerance analysis.

To be able to trace back errors in measurement, the measurement uncertainty of a measurement should also be indicated on the test report.

The tolerances given in the test report refer to the values specified in the data sheet, i.e. the measurement uncertainties of the test setup used are to be taken into account as well.

Unless otherwise specified, the specified tolerances are always to be observed.

Note: *Please take into account the ETSI Technical Report ETR 028.*
The given tolerances refer to CMU data sheet 04/99.

Manual Test Procedure

Some additional measurements can only be performed using a mobile phone via the normal operating menus of the CMU. These measurements are described in the section *'Function Test with Mobile Stations'*.

The suggested frequencies and levels at which the measurements should be performed have been selected according to the instrument concept. The user can of course also select other frequencies and levels within the scope of values guaranteed in the data sheet.

Note: *Before testing the rated specifications, allow the instrument to warm up for at least 15 min. The ambient temperature should be 23 °C to 35 °C.*

Selftest

The CMU offers various selftest possibilities for checking the functioning and for troubleshooting. Before carrying out the performance test, the following selftests should be performed.

- Selftest in the BASE (maintenance) menu
  - Continuous selftest
  - 1→4/3→2 RF Loop

Diagnostic Voltages

Preparation: ➢ Start user SW of the CMU (switch on instrument).

Test: ➢ Select the individual test in the BASE (MAINTENANCE) menu and check the results (Continuous selftest, 1→4/3→2 RF Loop).

Note: *Continuous Selftest: Selftest via System Selftest and Internal RF Loop Selftest, passed/failed with error output is only indicated; additionally in case of errors, it is created an error file 'cst.err'.*

1→4/3→2 RF Loop: Selftest RF Path RF1→RF4IN and RF3OUT→RF2 via external N-coax cable by power measurements via internal generator and analyzer, in this case all measured values are indicated.

If you want more detailed information start the following tests:

System selftest:	*Selftest instrument for diagnostic voltages, passed/failed with error output is only indicated.*
Internal RF Loop Selftest:	*Selftest RF path by power measurements via internal generator and analyzer, in this case all measured values are indicated.*
FE Selftest:	*Selftest Module RF FRONTEND for diagnostic voltages, in this case all measured values are indicated.*
REF Selftest:	*Selftest Module REFERENCE BOARD for diagnostic voltages, in this case all measured values are indicated.*
DIG Selftest:	*Selftest Module DIGITAL BOARD for diagnostic voltages, in this case all measured values are indicated*
RXTX1 Selftest:	*Selftest Module RXTX1 BOARD for diagnostic voltages, in this case all measured values are indicated.*

Interface Test

IEC-bus Interface

Preparation:

- Connect the IEC-bus interfaces of the CMU and the controller via IEC-bus cables.

Test:

- Send the string '*IDN?<CR><NL>' from the controller to the CMU and read the reply *STRING* of the CMU.

  The reply *STRING* must contain the following message:

  'ROHDE & SCHWARZ,CMU<Var>,<Ser_Nr>,<Firmware_Vers._Nr>'

RS-232 Interface

Preparation:

- Connect the RS-232 interfaces of the CMU and the controller via null-modem cables (cf. page 5.1.1, "Measuring Instruments and Auxiliary Means").

Set the RS-232 interface of the controller to 8 data bits, 1 start bit, 1 stop bit, no parity bit, XON/XOFF handshake and 19200 baud.

Test:

- Send the string '*IDN?<CR><NL>' from the controller to the CMU and read the reply string of the CMU.

The reply string must contain the following message:

'ROHDE & SCHWARZ,CMU<Var>,<Ser_Nr>,<Firmware_Vers._No>'

Reference Frequencies

For adjustment of the internal reference oscillator, the synchronization with an external 10-MHz reference frequency is checked.

Note: *The resolution of the frequency counter/analyzer should be max. 1/10 of the maximum permissible deviation.*

REFIN

The frequency and level ranges and the pull-in range are checked. The signal generator and the frequency counter must be synchronized (test setup REF1).

Preparation:
- Feed in at REFIN: 52 MHz sinewave, 0.5 V(rms)
- Connect frequency counter to RF3OUT.

Control: Set CMU to external reference 52 MHz, RF 1 GHz (menu *RF ANALYZER/ GENERATOR*.)

Test: Use frequency counter to measure frequency deviation from 1 GHz.

Preparation
- Feed in at REFIN: 10 MHz sinewave, 0.5 V(rms).
- Connect frequency counter to RF3OUT.

Control:
- Set CMU to external reference 10 MHz, RF 1GHz.

Test:
- Use frequency counter to measure frequency deviation from 1 GHz.

Preparation:
- Feed in at REFIN: 1 MHz sinewave, 0.5 V(rms).
- Connect frequency counter to RF3OUT.

Control:
- Set CMU to external reference 1 MHz, RF 1 GHz.

Test:
- Use frequency counter to measure frequency deviation from 1 GHz.

Preparation:
- Feed in at REFIN: 10.000 050 MHz sinewave, 2 V(rms).
- Connect frequency counter to RF3OUT.

Control:
- Set CMU to external reference 10 MHz, RF 1 GHz.

Test:
- Use frequency counter to measure frequency deviation from 1.000 005 000 GHz.

Preparation:
- Feed in at REFIN: 9.999 950 MHz sinewave, 2 V(rms).
- Connect frequency counter to RF3OUT.

Control:
- Set CMU to external reference 10 MHz, RF 1 GHz.

Test:
- Use frequency counter to measure frequency deviation from 0.999 995 GHz.

REFOUT1

Int. 10MHz:

- Set CMU to internal reference.
- Measure at REFOUT1: 10MHz, level > 0.5 V(rms).

REFIN signal:

- Set CMU to external reference.
- Feed in at REFIN: 50 MHz TTL, (as an alternative +16dBm from signal generator).
- Measure at REFOUT1: 50MHz, level > 0.5 V(rms).
- Feed in at REFIN: 1 MHz TTL, (as an alternative +16dBm from signal generator).

Measure at REFOUT1: 1 MHz, level > 0.5 V(rms).

REFOUT2

Frequency Range TX and Frequency Accuracy

Preparation: Test setup TX5, but CMU not synchronized with frequency counter/analyzer.
CMU connector RF3OUT

Control:
- Set CMU to desired frequency, level 0 dBm.

Test:
- Determine frequency deviation from nominal frequency.

Frequency Settling Time TX

Preparation: Test setup TX5, in addition trigger cable from CMU (D-sub connector AUX3, pin2) to analyzer.

CMU connector RF3OUT

Analyzer: Sweep time 1ms / 100µs, center = target frequency, span=0, FM demodulation, external trigger

Control: ➢ Set CMU to desired frequencies and hopping, level 0 dBm.

Test: Time from trigger point when the specified offset from the target frequency is reached.

Reflection Coefficients TX

Preparation: ➢ Connect (scalar) network analyzer to RF1, RF2, RF3OUT one after the other.

Cable losses must be corrected.

Control: ➢ CMU: Set generator level to minimum (-130 dBm or -90 dBm).

Test: ➢ Measure reflection coefficient loss at 100kHz, 10 MHz, 900 MHz, 1800 MHz, 2200 MHz, 2700 MHz.

Level Accuracy TX

Preparation: Test setup TX1 to TX4 (depending on level range)

Control: ➢ Set CMU to desired connector, frequency and level (RF Analyzer must be OFF).

Test: ➢ Measure the TX level of the CMU.

Note: *The given frequencies and levels are suggested values; of course, it is also possible to use other values for the measurement.*

Dynamic Level Settling TX

Dynamic

Preparation: Test setup TX5, in addition trigger cable from CMU (D-sub connector AUX3, pin2) to analyzer.

CMU connector RF3OUT

Analyzer: Sweep time 1ms / 100µs, center = 1 GHz , span=0, external trigger, RBW = 10 kHz
Use appropriate input attenuation.

Control: ➢ Set CMU to frequency = 1 GHz, specified level and ramping mode is ON.

Testing: ➢ The switch-off dynamic of the burst signal is measured.

Settling Time

Preparation: Test setup TX5, in addition trigger cable from CMU (D-sub connector AUX3, pin2) to analyzer.

CMU connector RF3OUT

Analyzer: Sweep time = 40 µs, center = 1 GHz , span=0, RBW=10 MHz, external trigger

Control: ➢ Set CMU to frequency = 1 GHz, specified level and bursting mode.

Test: ➢ The time period from the trigger point to the point in time when the nominal level < 0.5 dB has been reached is measured.

Spectral Purity TX

Harmonics

Preparation: Test setup TX5

Analyzer: center = 2 x f_{nom} or center = 3 x f_{nom}, span = 1 MHz.

Control: ➢ Set CMU to connector RF2, specified frequency, level = -10 dBm.

Test: ➢ The suppression of the signal at twice or three times the nominal frequency is measured referred to the nominal signal.

Control: ➢ Set CMU to connector RF3OUT, specified frequency, level = +10 dBm.

Test: The suppression of the signal at twice and three times the nominal frequency is measured referred to the nominal signal.

Nonharmonics

Preparation: Test setup TX5

Analyzer: Center = specified test frequency, RBW = 100 kHz, span = 1 MHz.

Control: ➢ Set CMU to connector RF3OUT, specified setting frequency, level = 0 dBm.

Test: ➢ The suppression of the signal is measured at the test frequency relative to the set signal.

Preparation: Test setup TX5

Analyzer: Center = specified test frequency, RBW = 100 kHz, span = 1 MHz.

Control: ➢ Set CMU to connector RF3OUT, specified setting frequency, level = +10 dBm.

Test: ➢ The suppression of the signal is measured at the test frequency relative to the set signal.

Inband Spurious

Spurious signals within the specified frequency bands are checked.

Preparation: Test setup TX5
Analyzer: Start/Stop = specified frequency range, RBW = 100 kHz

Control:
- Set CMU to connector RF3OUT, specified setting frequency, level = +10 dBm.

Test:
- The suppression of the signal is measured at the test frequency relative to the set signal.

SSB Phase Noise

Preparation: Test setup TX5
- Connect spectrum analyzer or modulation analyzer to RF3OUT.

Control:
- Set CMU generator to specified RF frequency.

  Output level at RF3OUT 0 dBm
  analyzer to specified center frequency,
  span = 50 kHz to 5 MHz, RBW= span/500
  Noise measurement function

Test
- Measure the phase noise at the specified spacing from the carrier.

Residual FM

Preparation: Test setup TX5
- Connect spectrum analyzer or modulation analyzer to RF1.

Control:
- Set CMU generator to the specified RF frequency.

Output level at RF1 -27 dBm, analyzer to specified center frequency, demodulator

Test:
- The residual FM with the specified weighting is measured.

Residual AM

Preparation: Test setup TX5

➢ Connect spectrum analyzer or modulation analyzer to RF1.

Control: ➢ Set CMU Generator to specified RF frequency.

Output level at RF1 -27 dBm

Test: ➢ The residual AM with the specified weighting is measured.

Modulator Characteristics

The modulation quality of the analog IQ modulator of the CMU is measured.

Preparation Test setup TX5

➢ Connect spectrum analyzer to RF1.

Control: ➢ Set CMU generator to specified RF frequency.

Output level at RF1 -27 dBm

Switch on RF generator with offset modulation, 300-kHz filter

Set analyzer to center frequency f_c = 1000 MHz, span=300 kHz / 3 MHz

Test: The suppression of the carrier at f_c, of the sideband at f_c-f_{mod} as well as of other spurious responses in the range $f_c \pm n \times f_{mod}$ with n = 2...10 is measured referred to the useful sideband signal at $f_c + f_{mod}$.

Baseband Filter TX

The amplitude frequency response of the selected TX baseband filter (none, 30kHz, 300kHz) as well as of the complete TX path is measured.

Preparation: Test setup TX5

➢ Connect spectrum analyzer to RF3OUT.

Control: ➢ Set CMU generator to RF frequency f_c = 1000 MHz.

Output level at RF3OUT +10 dBm

Switch on RF generator with offset modulation, 300-kHz filter

Analyzer to center frequency f_c = 1000 MHz, span = 300 kHz / 3 MHz

Test: ➢ The amplitude frequency response is measured.

GSM Modulation

The GSM phase/frequency error of a TX path is measured.

Preparation: Test setup TX5

- ➢ Connect spectrum analyzer FSE with FSE-B7 to RF3OUT.

Control:

- ➢ Set CMU generator to specified RF frequency.

  Output level at RF3OUT 0 dBm

  GSM dummy bursts

  Analyzer to specified center frequency, GSM demodulator

Test:

- ➢ Phase and frequency errors are measured according to GSM recommendation.

Power Meter RX

Broadband Power Meter

Preparation: Test setup RX1, RX2 (depending on level range)

Control:

- ➢ Set CMU to desired RX-connector, frequency and level in menu *RF ANALYZER/ GENERATOR*.
  Bandwidth = wide

Test:

- ➢ Measure RX level measurement accuracy of CMU.

Note: *The given frequencies and levels are suggested values; of course, it is also possible to use other values for the measurement.*

Narrowband Power Meter

Preparation: Test setup RX1, RX2 (depending on level range)

Control:

- ➢ Set CMU to desired RX-frequency and level in menu *RF ANALYZER/ GENERATOR*.
  Bandwidth=100 kHz

Test:

- ➢ Measure RX level measurement accuracy of CMU.

Note: *The given frequencies and levels are suggested values; of course, it is also possible to use other values for the measurement.*

Spectral Purity RX

Spurious Responses/Image Rejection

- Set CMU: RF4IN, Reflev = xx , receive freq=f_{cmu}
- Feed in generator signal: $f_{gen} = f_{cmu}$, 0 dBm.

SSB Phase Noise

Preparation:
- Test setup: Set CMU to desired connector, frequency and +10dBm.

Control:
- Set CMU to desired connector, frequency and level.

Test:
- The measurement is taken with a small test bandwidth at different carrier offsets.

Note: *e.g. RBW=100 Hz --> phase noise = measured value -21 dB.*

IF Bandwidth RX

Preparation:
- ➢ Test setup RX3, connect RF4IN.
- ➢ Set generator to f=1000 MHz + Δf, 0 dBm.

Control:
- ➢ Set CMU to f=1000 MHz, expected power = 0 dBm.

Test:
- ➢ Use narrowband power meter in menu *RF ANALYZER/GENERATOR*, bandwidth = 1kHz
  MAXlevel = measured power at Δf = 0.

  Note: The amplitude frequency response of the IF filters is measured.

Dynamic Range (Displayed Noise Floor)

Preparation: No signal is fed in, CMU generator is OFF.

Control: Set CMU to given receive frequency, expected power, bandwidth, low-noise operation.

Test: Use narrowband power meter, measurement bandwidth = 1 kHz/ 500 kHz

Measured value in dB under Reflevel (Expected Power)

Spectrum Analyzer Spurious

Preparation:
- ➢ Disconnect all instruments from CMU.

Control: Set CMU to spectrum analyzer mode, desired start, stop, frequency, excepted power level.

Test: Measure attenuation of spurious respective to excepted power level.

GSM Measurements

Only with Option CMU-K21, CMU-K22 or CMU-K23

Phase/ Frequency Error RX

Preparation:
- ➢ Connect GSM signal generator to RF2 (test setup RX3)

  Signal generator must be synchronized with the CMU via the 10-MHz reference frequency.

Control:

Signal generator:
- 940 MHz (GSM900)
- 1850 MHz (GSM1800)
- 1950 MHz (GSM1900)
- 10 dBm, GSM signal
- CMU:GSM module test, 940 (1850/1950) MHz, Exp.Power 13 dBm

Test:
- ➢ Measure GSM phase error (rms and peak) as well as frequency error.

Power Ramp RX

Preparation:
- ➢ Connect GSM signal generator to RF2.

  Signal generator must be synchronized with the CMU via the 10-MHz reference frequency.

Control

Signal generator:
- 940 MHz (GSM900)
- 850 MHz (GSM1800)
- 1950 MHz (GSM1900),
- 10 dBm, GSM signal, bursted
- CMU: GSM module test, 940 (1850/1950) MHz, Exp.Power 13 dBm

Test:
- Measure power ramp, dynamic range

Spectrum due to Modulation

to be defined

Spectrum due to Switching

to be defined

Function Test with Mobile Stations

GSM mobile station test

Only with Option CMU-K21, CMU-K22 or CMU-K23

Location Update
Call to MS
Call Release
Call from MS
Echo test
Power ramp, Phase/Frequency error measurement
Call Release

CDMA Mobile Station Test

to be defined

IS136-Mobile Station Test

to be defined

Test Report

ROHDE & SCHWARZ	Universal Radio Communication Tester CMU	1100.0008
Serial number:		
Test person:		
Date:		
Signature:		

Table 1-2Test report

Item No.	Characteristic	Measure-ment to section	Min.	Actual	Max.	Measure-ment un-certainty	Unit	Calibration every	
								1 year	3 years
	Ambient temperature during calibration		23		35		℃	X	
	CONTINUOUS SELFTEST		passed		passed			X	
	1→4/3→2 RF LOOP SELFTEST		passed		passed			X	
	Adjusting +5VDC REFERENCE VOLTAGE	Chapter 2	4.999		5.001		mV		X
	Adjusting TCXO 10MHz at RFOUT 3 1GHz (if none of the options CMU-B11 or B12 is installed)	Chapter 2	-50		+50		Hz	X	
	Adjusting CMU-B11 OCXO 10MHz at RFOUT 3 1GHz (if option CMU-B11is installed)	Chapter 2	-10		+5		Hz	X	
	Adjusting CMU-B12 OCXO 10MHz at RFOUT 3 1GHz (if option CMU-B12 is installed)	Chapter 2	-10		+5		Hz	X	
	REFIN 10 MHz		-1		+1		Hz		X
	REFIN 1 MHz		-1		+1		Hz		X
	REFIN 10MHz+50 Hz		-1		+1		Hz	X	
	REFIN 10MHz-50 Hz		-1		+1		Hz	X	
	REFOUT1		0.5		2.5		V(rms)		X
	REFOUT1		0.5		2.5		V(rms)		X
	REFOUT1		0.5		2.5		V(rms)		X
	REFOUT2 39 MHz		-1		+1		Hz		X
	REFOUT2 1.219 MHz		-1		+1		Hz		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Frequency accuracy 100 kHz		-1		(+1)		Hz		X
	Frequency accuracy 10 MHz		-10 -1 -1		+10 (TCXO), +1 (B11), +1 (B12)		Hz		X
	Frequency accuracy 600 MHz		-600 -60 -3		+600 (TCXO), +60 (B11), +3 (B12)		Hz		X
	Frequency accuracy 1199 MHz		-1199 -120 -6		+1199 (TCXO), +120 (B11), +6 (B12)		Hz		X
	Frequency accuracy 1200 MHz		-1200 -120 -6		+1200 (TCXO), +120 (B11), +6 (B12)		Hz	X	
	Frequency accuracy 2200 MHz		-2200 -220 -11		+2200 (TCXO), +220 (B11), +11 (B12)		Hz		X
	Frequency accuracy 2700 MHz		-2700 -270 -13.5		+2700 (TCXO), +270 (B11), +13.5 (B12)		Hz		X
	Frequency settling time 100 MHz ->200 MHz				400		µs		X
	Frequency settling time 100 MHz ->200 MHz				400		µs		X
	Frequency settling time 100 MHz ->200 MHz				400		µs		X
	Frequency settling time 100 MHz ->200 MHz				400		µs		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Frequency settling time 100 MHz ->200 MHz				400		µs		
	Refection coefficient RF1 10 MHz				0.83		dB		X
	Refection coefficient RF1 900 MHz				0.83		%		X
	Refection coefficient RF1 1800 MHz				0.83		%		X
	Refection coefficient RF1 2200 MHz				0.83		%		X
	Refection coefficient RF1 2700 MHz				5.3		%		X
	Refection coefficient RF2 10 MHz				0.83		%		X
	Refection coefficient RF2 900 MHz				0.83		%		X
	Refection coefficient RF2 1800 MHz				0.83		%		X
	Refection coefficient RF2 2200 MHz				0.83		%		X
	Refection coefficient RF2 2700 MHz				5.3		%		X
	Refection coefficient RF3 10 MHz				4		%		X
	Refection coefficient RF3 900 MHz				4		%		X
	Refection coefficient RF3 1800 MHz				4		%		X
	Refection coefficient RF3 2200 MHz				4		%		X
	Refection coefficient RF3 2700 MHz				6.7		%		X
	Dynamic level setting TX, Dynamic range at P = +10 dBm		80				dBc		X
	Dynamic level setting TX, Dynamic range at P = -20 dBm		60				dBc		X
	Dynamic level setting TX, Dynamic range at P = -50 dBm		50				dBc		X
	Dynamic level setting TX, Dynamic range at P = -80 dBm		20				dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Dynamic level setting, setting time at P = +10 dBm				4		µs		X
	Dynamic level setting, setting time at P = -20 dBm				4		µs		X
	Dynamic level setting, setting time at P = -50 dBm				4		µs		X
	2nd harmonic at RF2 at nominal frequency = 10 MHz				-30		dBc		X
	2nd harmonic at RF2 at nominal frequency = 800 MHz				-30		dBc		X
	2nd harmonic at RF2 at nominal frequency = 1800 MHz				-30		dBc		X
	2nd harmonic at RF2 at nominal frequency = 2700 MHz				-30		dBc		X
	3rd harmonic at RF2 at nominal frequency = 10 MHz				-30		dBc		X
	3rd harmonic at RF2 at nominal frequency = 800 MHz				-30		dBc		X
	3rd harmonic at RF2 at nominal frequency = 1800 MHz				-30		dBc		X
	3rd harmonic at RF2 at nominal frequency = 2300 MHz				-30		dBc		X
	2nd harmonic at RF3OUT at nominal frequency = 10 MHz				-20		dBc		X
	2nd harmonic at RF3OUT at nominal frequency = 100 MHz				-20		dBc		X
	2nd harmonic at RF3OUT at nominal frequency = 1000 MHz				-20		dBc		X
	2nd harmonic at RF3OUT at nominal frequency = 2200 MHz				-20		dBc		X
	2nd harmonic at RF3OUT at nominal frequency = 2700 MHz				-20		dBc		X
	3rd harmonic at RF3OUT at nominal frequency = 10 MHz				-20		dBc		X
	3rd harmonic at RF3OUT at nominal frequency = 100 MHz				-20		dBc		X
	3rd harmonic at RF3OUT at nominal frequency = 1000 MHz				-20		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	3rd harmonic at RF3OUT at nominal frequency = 2200 MHz				-20		dBc		X
	3rd harmonic at RF3OUT at nominal frequency = 2300 MHz				-20		dBc		X
	Nonharmonics, at 13.85 MHz, CMU setting = 14,35 MHz				-40		dBc		X
	Nonharmonics, at 36.9333 MHz CMU setting = 37,4333 MHz				-40		dBc		X
	Nonharmonics, at 41.55 MHz CMU setting = 42,05 MHz				-40		dBc		X
	Nonharmonics, at 110.8 MHz CMU setting = 111,3 MHz				-40		dBc		X
	Nonharmonics, at 221.6 MHz CMU setting = 221,1 MHz				-40		dBc		X
	Nonharmonics, at 332.4 MHz CMU setting = 332,9 MHz				-40		dBc		X
	Nonharmonics, at 501.37 MHz CMU setting = 501,87 MHz				-40		dBc		X
	Nonharmonics, at 1329.6 MHz CMU setting = 1330,1 MHz				-40		dBc		X
	Nonharmonics, at 103.41 MHz				-40		dBc		X
	Nonharmonics, at 842.08 MHz CMU setting = 1201,0 MHz				-40		dBc		X
	Nonharmonics, at 989.81 MHz				-40		dBc		X
	Nonharmonics, at 1137.55 MHz				-40		dBc		X
	Inband spurious 880 MHz to 915 MHz CMU setting = 897,5 MHz				- 50		dBc		X
	Inband spurious 925 MHz to 960 MHz CMU setting = 942,5 MHz				- 50		dBc		X
	Inband spurious 1710 MHz to 1785 MHz CMU setting = 1747,5 MHz				- 50		dBc		X
	Inband spurious 1805 MHz to 1880 MHz CMU setting = 1842,5 MHz				- 50		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Inband spurious 1850 MHz to 1910 MHz CMU setting = 1880 MHz				- 50		dBc		X
	Inband spurious 1930 MHz to 1990 MHz CMU setting = 1960 MHz				- 50		dBc		X
	Inband spurious 869 MHz to 894 MHz CMU setting = 881,5 MHz				- 50		dBc		X
	SSB phase noise TX f=100 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise TX f=100 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise TX f=100 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise TX f=100 MHz, Δf=400 kHz				-118		dBc		X
	SSB phase noise TX f=100 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise TX f=945 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise TX f=945 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise TX f=945 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise TX f=945 MHz, Δf=400 kHz				-118		dBc		X
	SSB phase noise TX f=945 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise TX f=1850 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise TX f=1850 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise TX f=1850 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise TX f=1850 MHz, Δf=400 kHz				-118		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	SSB phase noise TX f=1850 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise TX f=2200 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise TX f=2200 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise TX f=2200 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise TX f=2200 MHz, Δf=400 kHz				-118		dBc		X
	SSB phase noise TX f=2700 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise TX f=2700 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise TX f=2700 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise TX f=2700 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise TX f=2700 MHz, Δf=400 kHz				-118		dBc		X
	SSB phase noise TX f=2700 MHz, Δf=2000 kHz				-118		dBc		X
	Residual FM at 1000 MHz 30 Hz to 15 kHz, rms				50		Hz		X
	Residual FM at 1000 MHz 30 Hz to 15 kHz, peak				200		Hz		X
	Residual FM at 1000 MHz CCITT, rms				5		Hz		X
	Residual FM at 2000 MHz 30 Hz to 15 kHz, rms				50		Hz		X
	Residual FM at 2000 MHz 30 Hz to 15 kHz, peak				200		Hz		X
	Residual FM at 2000 MHz CCITT, rms				5		Hz		X
	Residual AM at 500 MHz CCITT, rms				0.02		%		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Residual AM at 1000 MHz CCITT, rms				0.02		%		X
	Residual AM at 1500 MHz CCITT, rms				0.02		%		X
	Residual AM at 2200 MHz CCITT, rms				0.02		%		X
	Residual AM at 2700 MHz CCITT, rms				0.02		%		X
	Modulation characteristics carrier suppression, f_{mod}=10 kHz				-40		dBc		X
	Modulation characteristics carrier suppression, f_{mod}=100 kHz				-40		dBc		X
	Modulation characteristics Sideband suppression, f_{mod}=10 kHz				-30		dBc		X
	Modulation characteristics sideband suppression, f_{mod}=30 kHz				-30		dBc		X
	Modulation characteristics sideband suppression, f_{mod}=60 kHz				-30		dBc		X
	Modulation characteristics sideband suppression, f_{mod}=100 kHz				-30		dBc		X
	Modulation characteristics Sideband suppression, f_{mod}=135 kHz		-		-30		dBc		X
	Modulation characteristics Sideband suppression, f_{mod}= -10 kHz				-30		dBc		X
	Modulation characteristics Sideband suppression, f_{mod}= -30 kHz				-30		dBc		X
	Modulation characteristics Sideband suppression, f_{mod}= -60 kHz				-30		dBc		X
	Modulation characteristics Sideband suppression, f_{mod}= -100 kHz				-30		dBc		X
	Modulation characteristics Sideband suppression, f_{mod}= -135 kHz				-30		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Modulation characteristics Spurious in the ranges -100 kHz to -20 kHz and +20 kHz to +100 kHz , f_{mod}= +10 kHz				-50		dBc		X
	Modulation characteristics Spurious in the ranges -1350 kHz to -270 kHz and +270 kHz to +1350 kHz , f_{mod} = +135 kHz				-50		dBc		X
	Baseband filter 30 kHz Record reference value at f_{mod}=0						dBm		X
	Baseband filter 30 kHz amplitude response at f_{mod}= +10 kHz		-0.2		+0.2		dB		X
	Baseband filter 30 kHz amplitude response at f_{mod}= +30 kHz		-0.3		+0.3		dB		X
	Baseband filter 30 kHz amplitude response at f_{mod}= +50 kHz		-12		-9		dB		X
	Baseband filter 30 kHz amplitude response at f_{mod}= +100 kHz				-50		dB		X
	Baseband filter 30 kHz amplitude response at f_{mod}= +135 kHz				-40		dB		X
	Baseband filter 300 kHz amplitude response at f_{mod}= +10 kHz		-0.2		+0.2		dB		X
	Baseband filter 300 kHz amplitude response at f_{mod}= +30 kHz		-0.2		+0.2		dB		X
	Baseband filter 300 kHz amplitude response at f_{mod}= +50 kHz		-0.2		+0.2		dB		X
	Baseband filter 300 kHz amplitude response at f_{mod}= +100 kHz		-0.5		+0.2		dB		X
	Baseband filter 300 kHz amplitude response at f_{mod}= +135 kHz		-0.8		+0.2		dB		X
	Baseband filter "none" amplitude response at f_{mod}= +135 kHz		-0.8		+0.2		dB		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	GSM phase error TX at 945 MHz, rms		-1.5		+1.5		°		X
	GSM phase error TX at 945 MHz, peak		-6		+6		°		X
	GSM frequency error TX at 945 MHz		-15		+15		Hz		X
	GSM phase error TX at 1850 MHz, rms		-1.5		+1.5		°		X
	GSM phase error TX at 1850 MHz, peak		-6		+6		°		X
	GSM frequency error TX at 1850 MHz		-15		+15		Hz		X
	GSM phase error TX at 1950 MHz, rms		-1.5		+1.5		°		X
	GSM phase error TX at 1950 MHz, peak		-6		+6		°		X
	GSM frequency error TX at 1950 MHz		-15		+15		Hz		X
	SSB phase noise RX f=100 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise RX f=100 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise RX f=100 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise RX f=100 MHz, Δf=400 kHz				-120		dBc		X
	SSB phase noise RX f=100 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise RX f=945 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise RX f=945 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise RX f=945 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise RX f=945 MHz, Δf=400 kHz				-118		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	SSB phase noise RX f=945 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise RX f=1850 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise RX f=1850 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise RX f=1850 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise RX f=1850 MHz, Δf=400 kHz				-118		dBc		X
	SSB phase noise RX f=1850 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise RX f=2200 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise RX f=2200 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise RX f=2200 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise RX f=2200 MHz, Δf=400 kHz				-118		dBc		X
	SSB phase noise RX f=2700 MHz, Δf=2000 kHz				-118		dBc		X
	SSB phase noise RX f=2700 MHz, Δf=20 kHz				-100		dBc		X
	SSB phase noise RX f=2700 MHz, Δf=100 kHz				-100		dBc		X
	SSB phase noise RX f=2700 MHz, Δf=250 kHz				-110		dBc		X
	SSB phase noise RX f=2700 MHz, Δf=400 kHz				-118		dBc		X
	SSB phase noise RX f=2700 MHz, Δf=2000 kHz				-118		dBc		X
	IF Bandwidth RX Δf= 0 MHz		0		0		dB		X
	IF Bandwidth RX Δf= 1 MHz		-0.7		+0.5		dB		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	IF Bandwidth RX Δf= 2 MHz		-1.5		+0.5		dB		X
	IF Bandwidth RX Δf= 2.5 MHz		-2.0		+0.5		dB		X
	IF Bandwidth RX Δf= 3 MHz		-2.5		0		dB		X
	IF Bandwidth RX Δf= 10 MHz				-30		dB		X
	IF Bandwidth RX Δf= 20 MHz				-50		dB		X
	IF Bandwidth RX Δf= 30 MHz				-80		dB		X
	IF Bandwidth RX Δf= -1 MHz		-0.5		+0.5		dB		X
	IF Bandwidth RX Δf= -2 MHz		-0.5		+1.0		dB		X
	IF Bandwidth RX Δf= -2.5 MHz		-0.5		+1.0		dB		X
	IF Bandwidth RX Δf= -3 MHz		-0.5		+1.0		dB		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow=47 dBm, f=1000 MHz				-100		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz expPow=47 dBm, f=1800 MHz				-100		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow=47 dBm, f=2200 MHz				-100		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow=47 dBm, f=2700 MHz				-95		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow= 10 dBm, f=10 MHz				-100		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow= 10 dBm, f=500 MHz				-100		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Displayed Noise Floor RF1, MBW=1 kHz, expPow= 10 dBm, f=1000 MHz				-100		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow= 10 dBm, f=1800 MHz				-100		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow= 10 dBm, f=2200 MHz				-100		dBc		X
	Displayed Noise Floor RF1, MBW=1 kHz, expPow= 10 dBm, f=2700 MHz				-95		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = 33 dBm, f=10 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = 33 dBm, f=500 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = 33 dBm, f=1000 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = 33 dBm, f=1500 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = 33 dBm, f=2000 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = 33 dBm, f=2700 MHz				-68		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = -4 dBm, f=10 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = -4 dBm, f=500 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = -4 dBm, f=1000 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = -4 dBm, f=1500 MHz				-73		dBc		X
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = -4 dBm, f=2000 MHz				-73		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Displayed Noise Floor RF2, MBW = 500 kHz, expPow = -4 dBm, f=2700 MHz				-68		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = 0 dBm, f=10 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = 0 dBm, f=500 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = 0 dBm, f=1000 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = 0 dBm, f=1500 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = 0 dBm, f=2200 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = 0 dBm, f=2700 MHz				-95		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = -22 dBm, f=10 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = -22 dBm, f=500 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = -22 dBm, f=1000 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = -22 dBm, f=1500 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = -22 dBm, f=2200 MHz				-100		dBc		X
	Displayed Noise Floor RF4IN, MBW = 1 kHz, expPow = -22 dBm, f=2700 MHz				-95		dBc		X
	Spectrum analyzer Spurious RF2, exp. Pow = 33 dBm, RBW=1 MHz, Span=10...1200 MHz				-50		dBc		X

Item No.	Characteristic	Measurement to section	Min.	Actual	Max.	Measurement uncertainty	Unit	Calibration every	
								1 year	3 years
	Spectrum analyzer Spurious RF2, exp. Pow = 33 dBm, RBW=1 MHz, Span=1200 MHz...2200 MHz				-50		dBc		X
	Spectrum analyzer Spurious RF2, exp. Pow = 33 dBm, RBW=1MHz, Span=2200 MHz...2700 MHz				-50		dBc		X
	GSM phase error RX at 945 MHz, rms		-0.5		+0.5				X
	GSM phase error RX at 945 MHz, peak		-2		+2				X
	GSM frequency error RX at 945 MHz		-15		+15		Hz		X
	GSM phase error RX at 1850 MHz, rms		-0.5		+0.5				X
	GSM phase error RX at 1850 MHz, peak		-2		+2				X
	GSM frequency error RX at 1850 MHz		-15		+15		Hz		X
	GSM phase error RX at 1950 MHz, rms		-0.5		+0.5				X
	GSM phase error RX at 1950 MHz, peak		-2		+2				X
	GSM frequency error RX at 1950 MHz		-15		+15		Hz		X
	Loopback GSM Phase 945 MHz		-6		+6			X	
	Loopback GSM Frequency 945 MHz		-15		+15		Hz	X	
	Loopback GSM Phase 1850 MHz		-6		+6			X	
	Loopback GSM Frequency 1850 MHz		-15		+15		Hz	X	
	Loopback GSM Phase 1950 MHz		-6		+6			X	
	Loopback GSM Frequency 1950 MHz		-15		+15		Hz	X	

Level accuracy TX at RF1

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700MHz	-27 dBm to -130 dBm					X
10 MHz to 2700MHz	-27 dBm to -110 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy TX at RF2

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700MHz	-10 dBm to -130 dBm					X
10 MHz to 2700MHz	-10 dBm to -110 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy TX at RF3OUT

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700MHz	-10 dBm to -90 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy wideband power meter at RF1

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700MHz	+10 dBm to +47 dBm					X
10 MHz to 2700MHz	+10 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy wideband power meter at RF2

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700MHz	-4 dBm to +33 dBm					X
10 MHz to 2700MHz	-4 dBm				X	
10 MHz to 2700MHz	+6 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy wideband power meter at RF4IN

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700 MHz	-29 dBm to 0 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy frequency-selective power meter at RF1

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700 MHz	-34 dBm to +47 dBm					X
10 MHz to 2700 MHz	-34 dBm to +10 dBm				X	
10 MHz to 2700 MHz	Input level +10dBm Internal attenuator check for expected power range +10dBm to +47 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy frequency selective power meter at RF2

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700 MHz	-48 dBm to +33 dBm					X
10 MHz to 2700 MHz	-48 dBm to +10 dBm				X	
10 MHz to 2700 MHz	Input level +10 dBm Internal attenuator check for expected power range +10 dBm to +33 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

Level accuracy frequency-selective power meter at RF4IN

Frequency	Level	Min	Actual	Max	Calibration every	
					1 year	3 year
10 MHz to 2700 MHz	-74 dBm to 0 dBm				X	

Note: *Frequency steps and level steps to be defined.*
Tolerances according to data sheet.

2 Adjustment

The following chapter describes the manual adjustment of the reference sources as well as the software-controlled adjustment of individual module data following module replacement (automatic adjustment of module data).

The manual adjustment of the +5 VDC reference source which provides the highly stable DC reference voltage for the individual CMU modules as well as that of the 10 MHz reference frequency source which determines the frequency accuracy of the CMU are described. The adjustment permits to maintain and restore the data integrity of the instrument.

Manual adjustments must be performed at an ambient temperature between +23 °C and +30 °C after the instrument has warmed up.

After the software-controlled adjustment has been performed, the CMU is ready for use and offers full data integrity except for the level accuracy. In order to attain the level accuracy specified in the data sheet, it is necessary to record the path error data. To this end, the CMU must be tested using the test system ACS 100 (see chapter 1, *Performance Test*).

Manual Adjustment

In the following, the measuring instruments and auxiliary means required for the manual adjustment of the CMU, the appropriate preparations of the instrument as well as the individual adjustments will be explained.

Measuring Instruments and Auxiliary Means

Table 2-1 Measuring instruments and auxiliary means for manual adjustment of the CMU

Item	Type of instrument	Required characteristics	Appropriate device	R & S order number	Use page
1	Voltmeter	DC measurement	URE3	350.5315.03	
2	Spectrum analyzer with frequency counter	Frequency measurement up to 1 GHz	FSE	1066.3010.20 (30)	

Preparing the Instrument

Opening the casing:

- Remove the power plug on the CMU and place the CMU onto the front handles.
- Loosen the four Phillips screws at the four rear-panel feet and take off the feet.
- Pull off the instrument tube towards the top.
- Locate the adjustment devices (see chapter 5, *drawing 1100.0008.01 D page 3*).
- After performing the manual adjustment, close the casing again in the reverse order.

Note:

If only the Option OCXO REFERENCE OSC. CMU-B11/B12 is to be adjusted, it is not necessary to open the complete tube of the CMU. The adjustment can be made from outside through the ventilation holes using a small screwdriver (see chapter 5, drawing 1100.0008.01 D page 3).

Adjusting the + 5 VDC Reference-Voltage

Preparation:

- Connect the DC voltmeter test cable to the SMB plug X221 (see chapter 5, drawing 1100.1027.01 page 1) on the motherboard.
- Switch on the CMU and allow it to warm up for approx. 5 minutes.

Adjustment:

- Use potentiometer R120 on the REFERENCE BOARD to adjust the measured value at the DC voltmeter to + 5.000 V ± 1 mV.

Adjusting the 10 MHz Reference-Frequency

Preparation:

The measurement can be performed either at connector REFOUT1 (rear of CMU) at 10 MHz or at connector RF3OUT (front) at 1 GHz using a frequency counter.

- For the measurement at connector RF3OUT set the generator to 1 GHz and 13 dBm without modulation in the RF menu.

  For the adjustment, the CMU must be set to internal reference source.

- This setting is to be selected in the sync menu of the respective application.

Note: *The measurement at 1 GHz can be performed with a lower frequency counter resolution (1 Hz) in order to achieve a faster adjustment.*

TCXO

Adjustment:

- Use potentiometer R121 on the REFERENCE BOARD to adjust the measured value at the frequency counter to

  10.000 000 0 MHz ± 0.5 Hz (at REFOUT1) or
  1.000 000 000 GHz ± 50 Hz (at RF3OUT).

Note: *This adjustment is only required if none of the options CMU-B11 or B12 is installed.*

OCXO REFERENCE OSC. CMU-B11

(if option is installed)

Adjustment:

- Use potentiometer R5 on the OCXO REFERENCE OSC. BOARD to adjust the measured value at the frequency counter to

  10.000 000 00 MHz -0.1/ +0.05 Hz (at REFOUT1) or
  1.000 000 000 GHz -10Hz/ +5 Hz (at RF3OUT)

  (a lead of at least –2 to -5 Hz at 1 GHz is desired because of aging).

Note: *The CMU must have been switched on for at least 5 minutes so that the OCXO has warmed up.*

OCXO REFERENCE OSC. CMU-B12

(if the option is installed)

Adjustment:

- Use potentiometer R5 on the OCXO REFERENCE OSC. BOARD to adjust the measured value at the frequency counter to

  10.000 000 00 MHz -0.1/ +0.05Hz or (at REFOUT1) or
  1.000 000 000 GHz -10 Hz/ +5Hz (at RF3OUT)

  (a lead of at least –2 to -5 Hz at 1 GHz is desired because of aging).

Notes: *The CMU must have been switched on for at least 10 minutes so that the OCXO has warmed up.*
During the adjustment, operate the CMU in the horizontal position!

Automatic Adjustment of Module Data

In order to match the data stored in EEPROMs on the respective modules to the complete instrument, an automatic adjustment of module data is always necessary after replacing a module.

In addition to some standard information such as module name, serial number, hardware status and date of manufacture, these stored data items contain important pieces of information within value tables from module pre-testing, e.g. frequency responses for module error data.
These items of information permit to make the complete instrument ready for operation again (see also chapter 1, *Performance Test*).

In the following, the preparations and the procedure of the automatic module data adjustment will be explained.

Preparing the adjustment

Replacement of module(s):

- ➢ Replace the faulty module(s) (see chapter 3, *module replacement*).
- ➢ Close the CMU casing (see chapter 3, *module replacement*).
- ➢ Connect the CMU to the mains and switch on.

Performing the adjustment

Starting the version manager:

- ➢ Note the startup in the display when switching on the CMU for the first time.
- ➢ When a beep can be heard three times, press the *MENU SELECT* key.

  The version manager is started (see also chapter 4, *firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.

Procedure:

- ➢ Press the softkey to the left of the above mentioned menu item.

The automatic adjustment of module data is started under software control.

It may take a few minutes to additionally perform firmware updates for microprocessors and programmable devices.

After the adjustment has been terminated, press the softkey to the left of the EXIT menu item, the operating software starts and the CMU is ready for use and can be operated in the usual way.

3 Repair

This chapter describes the design of the CMU, simple measures for repair and troubleshooting and, in particular, the replacement of modules. For troubleshooting and diagnosis, a maintenance menu is available, which permits to poll diagnostic voltages of the modules and indicate limit violations.

The installation of options and updating of the software are explained in chapter 4 of this service manual.

Instrument Design and Function Description

Instrument design

A detailed schematic of the CMU design will be presented in the block diagram below and in the exploded view (see chapter 5).
The following function description of the instrument refers to the block diagram.

Cabinet design

The casing of the CMU is a robust, gray-blue Rohde & Schwarz standard casing BW 2000.
It consists of a frame with integrated rear panel and a labeling panel at the front of the frame. The frame is covered by a one-piece tube and screwed with four rear-panel feet. Two front handles are screwed to the frame as standard, a further handle on the left side can be provided as accessory.

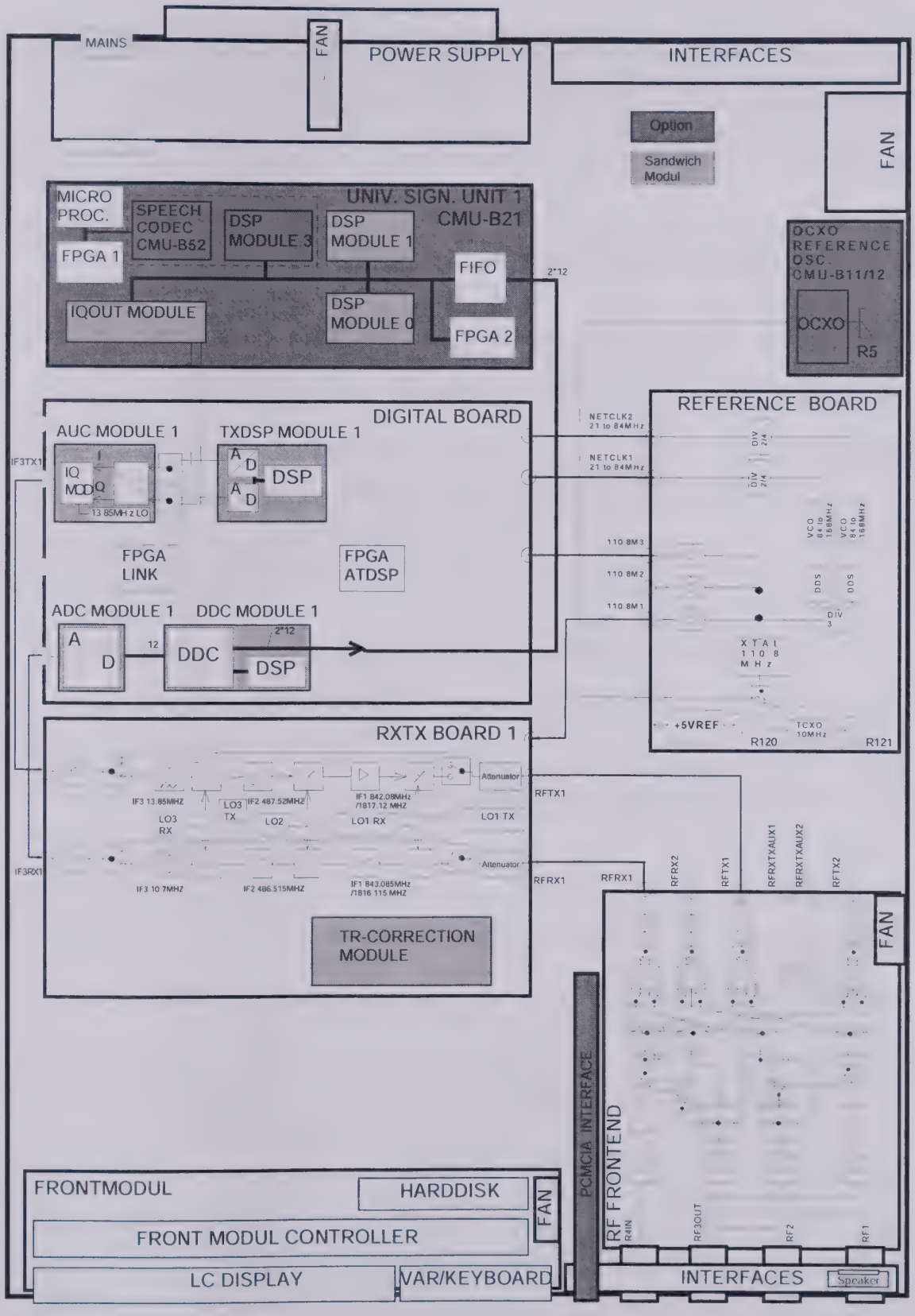
The dimensions are as follows:

Overall: W*H*L 465 mm * 193 mm * 517 mm

Rackmount: W*H 1/1 of 19 inch * 4 units

Note: *The words "left" and "right" in the manual always refer to the front view of the instrument.*

Block diagram



Instrument Frame

The instrument frame consists of front frame, module support, partition, cage and air duct. The module support is screwed to the front frame. It incorporates the partition, the cage and the air duct and provides all mechanical connectors and slots for modules. The MOTHERBOARD for electrical connection of the modules as well as the big fan for cooling the modules are screwed to the instrument frame.

Rear of Instrument Frame

At the rear of the CMU instrument frame, the power supply with integrated power plug and switch as well as other important electrical interfaces are fitted (see chapter 1, *operating manual*).
The power supply unit can be easily replaced.
A further rear panel that is screwed to the frame serves as support for further electrical interfaces and optional extensions.

Front of Instrument Frame

The front of the instrument frame incorporates the FRONT MODULE, the most important electrical interfaces as well as the optional FLOPPY DISK or PCMCIA INTERFACE drive.

FRONT MODULE

The components of the FRONT MODULE that are directly arranged at the front of the CMU are the LCD and the operating keys with the spinwheel.
The operating keys consist of a membrane and a mat inserted into the keyboard frame of the FRONT MODULE. The operating keys are colored differently to highlight their function and partly labeled.
This module can be conveniently replaced as a unit.

The beeper with sound outlet on the FRONT MODULE is used for acoustic prompts and error warnings.

Electrical interfaces

The electrical interfaces are mounted on an extra mounting plate. The RF interfaces are components of the RF FRONTEND.

Loudspeaker

A loudspeaker with sound outlets at the labeling panel allows for acoustic hints for AF signals. It is controlled via the option CMU-B41 AUDIO-GEN. + ANA.

Cooling the Instrument

Axial fan in the casing

The right side panel contains a temperature-controlled axial fan (120 mm x 120 mm x 38 mm), which sucks in cold ambient air at the right tube of the casing and blows it through the modules via a ventilation duct and further ventilation slots. The amount of air is controlled via the width of the slots depending on the power dissipation of the module.
The modules are cooled by the air flow, and the heated air is then blown out at the left side panel.

Axial fan of power supply

In addition, the power supply of the CMU is equipped with its own temperature-controlled axial fan (80 mm x 80 mm x 25 mm) with a separate air circulation. The fan sucks in cold air on the left rear side of the power supply casing and blows out the heat produced in the power supply on the right rear side of the power supply casing.

Axial fan of FRONT MODULE

For cooling the controller board, the FRONT MODULE is provided with its own axial fan (40 mm x 40 mm x 10 mm), which sucks in cold ambient air on the left side of the instrument and blows it out at the right side panel.

Axial fan of RF FRONTEND

The RF FRONTEND which can process powers up to 50 W is equipped with an aluminum casing with its own air duct, cooling fins and a temperature-controlled axial fan (40 mm x 40 mm x 20 mm), which dissipates the heat by sucking in cold air directly on the right rear side of the instrument and blowing in out again on the right front side of the instrument.

The cooling concept makes sure that all components are optimally cooled so that the complete instrument achieves a high MTBF.

FRONT MODULE

The FRONT MODULE consists of an aluminum case panel and a mounting plate which accommodates the LCD, the keyboard mat with the membrane and the spinwheel.
The case panel incorporates the FRONT MODULE CONTROLLER, the fan and the hard disk.

LCD

The color LCD provides a visible output of any information, measurements etc. to the user.
The resolution of the LCD is 640 * 480 pixels (VGA).
The display incorporates two cold cathode tubes for the illumination. The high voltage required for this purpose is generated in an extra DC/AC converter mounted next to the display on the mounting plate and connected both to the display and the controller board via a cable.
The liquid crystal display is controlled via a ribbon cable that is plugged in on the controller board.

Operating keys

The operating keys consisting of a keyboard mat and a membrane release a contact when the rubber key is pressed. Two LEDs for the STANDBY/ON key (orange for STANDBY/green for ON) are also accommodated on this membrane.
The rubber keys enable the user to call up all CMU functions.

The key evaluation and LED control are effected via a film cable connector on the controller board. Like the control of the two LEDs, it is controlled in a special microprocessor on the controller board by means of a matrix technique. This microprocessor permits to store the status of the STANDBY/ON key when switching off using the power switch.

Spinwheel

The spinwheel consists of a flexible magnetic ring with individual magnets for the lock-in positions. With each turn of the spinwheel, electrical pulses are released from the LEDs and the optical position detectors and sent via a ribbon cable to the microprocessor on the FRONT MODULE CONTROLLER for evaluation.
The spinwheel serves the user as a further means of data entry and operation.

FRONT MODULE CONTROLLER

The FRONT MODULE CONTROLLER contains all the necessary components on a board such as processor, memory chips, I/O devices (ISA bus), lithium battery, IEC-bus controller (IEEE), two serial interfaces (COM1/2), a parallel interface (LPT), LCD graphics controller, external VGA monitor graphics interface (monitor) and an external keyboard connection (keyboard PS/2).
In addition, a floppy controller for an external floppy disk drive and an IDE hard disk controller are integrated on the controller board.

Hard disk

The hard disk is screwed to the printed circuit board above the FRONT MODULE CONTROLLER (MODEL 04) or is screwed to the rear of the aluminum case panel (MODEL 12) and connected to the printed circuit board via a ribbon cable.

Fan

A small axial fan in the case panel produces an air flow through the FRONT MODULE CONTROLLER, cooling it with cold ambient air.

Connection

The FRONT MODULE is directly plugged to the MOTHERBOARD via two 96-pin FUTURE BUS connectors (MODEL 04) and one additional 110-pin PCI Bus connector (MODEL 12).

POWER SUPPLY

The POWER SUPPLY of the CMU consists of a two-part aluminum casing with three boards arranged in a so-called sandwich technique (U-shape). In addition to cooling, the axial fan already mentioned above (see cooling of instrument) is also used to support the three boards.

STANDBY/ON signal

The control signal STANDBY/ON controlled by the FRONT MODULE CONTROLLER (depending on the operating key STANDBY/ON on the front of the instrument frame) activates the power supply.

Power Factor Correction (PFC) and Standby circuit

The POWER SUPPLY is a primary clocked switching power supply with Power Factor Correction (PFC) and Standby circuit (+12 V Standby).
On the secondary side, it generates all DC voltages (+3.3 V; +5.2 V; +6 V; +8 V; +12 V; +12 VFAN; +12 V Standby; +28 V; -12 V) for the CMU.
The secondary voltages are open-circuit-proof and short-circuit-proof with respect to ground and each other.

POWERGOOD - Signal

When switching on and off (defined reset), the POWER SUPPLY generates a POWERGOOD signal for control of the FRONT MODULE CONTROLLER.

Overtemperature protection

An overtemperature protective circuit is additionally installed to prevent overheating. This status is taken to the FRONT MODULE CONTROLLER via a status signal (OT).

AC voltage supply

A 3-pin connector with integrated 2-pin mains switch for connection with the AC-Supply is installed on the rear panel of the POWER SUPPLY. From there, the AC supply voltage is internally taken to the first board via two cables.
Two fuses are also fitted there as a means of fire protection.

Note: *These fuses are not accessible to the user from outside and are only blown in the case of a serious fault of the power supply (servicing required!).*

Primary side

The following circuit parts follow on the first board: EMI filter and power rectifier. The rectified AC supply voltage is taken via a cable to the second board of the Power Factor Correction (PFC). This circuit converts the rectified AC supply voltage up to a constant voltage of 380 VDC. Then this voltage is taken to a step down converter which provides a constant voltage of 280 VDC for the subsequent resonance step down converter, which chops it with approx. 35 kHz.
An additional connecting cable is used to feed the big transformer located on the first board. It is provided with taps for the various secondary voltages, and the following rectifiers constitute the transition to the DC secondary side.

Secondary side

The +12 V-, -12 V- and +6 V- secondary voltages are provided with analog regulators in order to ensure a high spurious suppression.
The +3.3 V- and +5.2 V- secondary voltages have their own stepdown converters to achieve small power dissipations.
The +28 V- voltage requires a stepup converter in order to generate the high voltage with a high accuracy.
At the +12 VFAN, a constant current source is used for efficient suppression of fan interference.
The secondary voltages are then filtered and subsequently taken to the output connector.

Standby converter and control unit

The third printed circuit board which serves as a connection between the first and second board accommodates the control and monitoring circuit parts. Besides, it includes the standby converter, which generates a +12-V standby voltage from the 380 VDC voltage of the PFC circuit.

Connection

The POWER SUPPLY is directly connected to the MOTHERBOARD via a 96-pin FUTURE-bus connector on the MOTHERBOARD and screwed to the integrated rear panel of the CMU with its casing.

MOTHERBOARD

The MOTHERBOARD consists of five individual printed circuit boards: MOTHERBOARD1, MOTHERBOARD2, FRONTPANEL BOARD, REARPANEL BOARD1 and REARPANEL BOARD2.

MOTHERBOARD1

The MOTHERBOARD1 is the central motherboard and serves as connection between most of the modules. It supplies the modules both with voltages and control, status and bus signals in various layers (12-layer multilayer).
The MOTHERBOARD1 accommodates various ISA bus driver devices for the PCMCIA INTERFACE control as well as protective circuits. These protective circuits consist of diodes and polyswitches (current-dependent, self-opening and closing fuses) and protect against external overvoltages of the interface signals.
Nine LEDs indicate the status of the supply voltages and help with troubleshooting.
On MOTHERBOARD1, a circuit for temperature-dependent instrument fan control is also implemented:
The individual module temperatures are polled by the FRONT MODULE CONTROLLER of the CMU. This information is passed on via the DIGITAL BOARD to the fan control with the aid of a control signal. The instrument fan is controlled such that an optimum module temperature is achieved on the one hand and as little noise as possible is emitted by the fan on the other hand.

MOTHERBOARD2

The MOTHERBOARD2 serves for supply and connection of the modules located higher at the side, the REFERENCE BOARD and a further option.
For connection with MOTHERBOARD1 two 50-pin ribbon cables are used.

FRONTPANEL BOARD

The FRONTPANEL BOARD is located at the front of the instrument frame and accommodates the external interfaces DATA1, DATA2, AUX3 and SPEECH. Besides, the six LEDs for the display of the active RF inputs/outputs are located there.
For connection with MOTHERBOARD1 a 50-pin ribbon cable is used.

REARPANEL BOARD1

The REARPANEL BOARD1 is screwed to the integrated rear panel of the CMU below the POWER SUPPLY and accommodates the external interfaces IEEE, LPT, COM1, COM2, monitor and keyboard.
For connection with MOTHERBOARD1 two 34-pin ribbon cables are used.

REARPANEL BOARD2

The REARPANEL BOARD2 is mounted to the right of the integrated and unscrewable rear panel plate and accommodates the interfaces SERVICE, AUX, AUX4 as well as further spare interfaces. For connection with MOTHERBOARD1 two 34-pin ribbon cables are used.

REFERENCE BOARD

The REFERENCE BOARD provides all required clock signals (NETCLK1/2) and reference frequencies (110.8 MHz) as well as the +5 VDC reference voltage for the CMU. The REFERENCE BOARD is a plug-in module in HVC design.

Design

At the top of the module, nine MMCX connectors are attached, which serve as inputs or outputs for various clock signals and are routed to the respective modules or the integrated rear panel with appropriate coax cables.
Two holes in the HVC panel at the top are used for adjusting the +5 VDC reference voltage and the 10 MHz TCXO reference frequency.

Connection

The plug-in module REFERENCE BOARD is inserted in the CMU on the right side on MOTHERBOARD2 using a 48-pin FUTURE-bus connector.

REFERENCE frequency generation

All frequencies provided by the CMU are derived from internal high-precision 10-MHz reference elements (TCXO or optional OCXO) or from externally applied frequencies.
A 110.8-MHz crystal oscillator is coupled in locked phase relation in a PLL loop with the selected reference.
The reference element TCXO is used as standard on the reference board. If the option OCXO (CMU-B11 or -B12) is installed in the CMU, it is automatically used as reference element and the standard TCXO is switched off.
It is additionally possible to switch over to external synchronization (see operating manual, *4.34 Connection Control-Synch.*) and use the signal fed in at the BNC connector REFIN at the rear of the CMU as reference signal.
At the BNC connector REFOUT1 at the rear of the CMU, either the internal 10-MHz reference frequency or the signal applied at REFIN can be buffered and tapped depending on the selected reference element.
The 110.8-MHz sinewave signal of the crystal oscillator passes a harmonics filter, is buffered and provided at three MMXC connectors, serving as reference frequency for the RXTX BOARD1/2 and the DIGITAL BOARD.
At a further MMCX connector, the TTL signal RESFREQ is available with 27.7 MHz (110.8 MHz / 4) for the option CMU-B41 AUDIO-GEN. + ANA. as clock signal.

Netclock generation

The REFERENCE BOARD is also used for netclock generation, providing adjustable TTL clock frequencies from 21 MHz to 84 MHz with a very fine frequency resolution of 0.1 Hz. This function is provided twice so that two independent netclock frequencies are available at the same time.

The signal generated by the 110.8-MHz crystal oscillator is divided by three and applied to a DDS circuit (Direct Digital Synthesis). The DDS circuit is used as a fine-adjustable frequency divider and generates a divided signal from 9 MHz to 12 MHz.
This signal is then used in a further PLL as nominal value for the phase detector in order to tune a VCO (Voltage Controlled Oscillator) with a tuning range of 84 MHz to 168 MHz in locked phase relation.
A fractional divider used in the feedback of the PLL provides the actual value for the phase detector.

The output signal of the VCO is divided by two or four, buffered and provided at the MMCX connector NETCLK 1 or NETCLK 2 and serves as network-specific TTL clock for the DIGITAL BOARD.

Option OCXO REFERENCE OSC. CMU-B11 or B12

This option consists of a printed circuit board with the reference element OCXO (oven-controlled crystal oscillator), the control circuit and a potentiometer for adjusting the OCXO.

Installation

The option OCXO REFERENCE OSC. is installed on the right side below the instrument fan such that the potentiometer is easily accessible from outside without the need for opening the CMU tube.

Connection

The option OCXO is directly inserted via a 10-pin connector on the MOTHERBOARD and screwed to the module support by means of three screws.

The options CMU-B11 and B12 are basically of the same design. The two options only differ from each other in the technical data of the OCXO such as aging and frequency drift.

RF FRONTEND

Design

The printed circuit board of the RF FRONTEND is installed in a silver-coated aluminum casing which is screwed to the instrument frame. The RF FRONTEND is fitted at the right front of the CMU such that the four RF N-type connectors which are directly connected to the FRONTEND board are accessible on the front of the instrument frame of the CMU. This is absolutely necessary to ensure a good VSWR (Voltage Standing Wave Ratio).

Cooling system

The aluminum casing in which the RF FRONTEND is installed is equipped with cooling fins in a special cooling duct and an extra temperature-controlled fan for heat dissipation if high RX power is fed in.

Control and supply

Control and supply of the RF FRONTEND are effected from MOTHERBOARD1 via a 34-pin ribbon cable.

RF connectors

For the internal RF connection to the RXTX BOARD1 (RFRX1, RFTX1) two SMA screw connections and coaxial solid-jacket cables are used. Thus a high-quality RF connection is ensured.
Besides, two further internal RF connections (RFRX2, RFTX2) to the optional RXTX BOARD2 are available.

Two bidirectional monitor inputs/outputs (RFRXTXAUX1/2) at the RF FRONTEND permit to connect further RF devices via optional cables leading to the integrated rear panel of the CMU.
As external RF interface, the RF FRONTEND is equipped with the four N-type connectors RF1, RF2, RF3OUT, RF4IN, which permit to perform all the RF measurements of the CMU.
RF1 and RF2 are bidirectional inputs/outputs depending on the setting and measurement application.
RF3OUT is a unidirectional output.
RF4IN is a unidirectional input.

Optical indication

For optical indication of the selected N-connectors and input and/or output functions, yellow LEDs located above the N-connectors are switched on.

Functions

On the transmitter side (TX), the RF FRONTEND serves the purpose of distributing internal RF signals to the outside to the various N-connectors (RF1, RF2, RF3OUT) and attenuate or amplify them according to the selected output and level.
On the receiver side (RX), its purpose is to internally distribute external RF signals from the different N-connectors (RF1, RF2, RF3OUT) and attenuate or amplify them according to the selected input and the applied level.
Since high levels and powers up to 50 W can be fed in on the receiver side (RX), the RF FRONTEND is equipped with power attenuators and the cooling system with the fan described above, which is controlled by the temperature at the power attenuators.
The RF FRONTEND additionally features two broadband power measuring diodes, which permit to measure the power applied at the N-connectors RF1, RF2, RF4IN even in pulsed operation.

RXTX BOARD1

The RXTX BOARD1 constitutes the central RF board which contains all circuit parts for conversion from RF to IF both for the transmitter (TX) and receiver (RX).

Design

The RXTX BOARD1 is designed as plug-in module with a silver-coated two-shell aluminum casing fixed with several screws.

Cooling system

This casing is equipped with cooling fins at the front and rear which are provided with a cover sheet each so that two special cooling ducts are produced. These cooling ducts are evenly cooled by the air flow of the instrument fan irrespective of neighboring modules.
This efficient cooling is required since a very high degree of integration and a large portion of fast RF components are implemented on this board.

Control and supply

Control and voltage supply of the RXTX BOARD1 are effected via a 96-pin FUTURE-bus connector from MOTHERBOARD1.

Complete function

For conversion from RF to IF, the transmitter side (TX) is implemented on one side of the multilayer PC board and the receiver side (RX) on the other side on the RXTX BOARD1. This strict separation of the functions permits to achieve high decouplings as they can usually only be achieved with two separate modules.

Transmitter functions

On the transmitter side (TX), an IF signal with 13.85 MHz is applied at the MMCX connector IF3TX1 (top of module) of the RXTX BOARD1, which is provided by the DIGITAL BOARD.
On the RXTX BOARD1, this signal is taken via various amplifier stages, attenuator pads and filters and finally set to the desired RF frequency by means of triple signal conversion (IF3, IF2, IF1). This is necessary to obtain a high image-frequency rejection.

At the TX output, a switchable attenuator with fine stepping and large attenuation range is used to set the RF signal amplitude according to the level selected.

The RF signal is finally taken to the RF FRONTEND at the SMA connector RFTX1 (bottom of module).

The transmitter side is provided with an extra LO1TX (Local Oscillator) with large tuning range and very fine frequency resolution used for setting the desired transmitter frequency, an LO2 fixed-frequency oscillator shared with the receiver side and an extra LO3TX with small tuning range. All LOs are synchronized by the MMCX connector 110.8MHz at the bottom of the module with the reference frequency from the REFERENCE BOARD.
Besides, an MMCX connector at the top of the RXTX BOARD1 is designed as input with the second transmitter IF (RESIF2TX) which is activated via software switches.

Receiver functions

On the receiver side (RX), the RF signal is fed in at the SMA connector RFRX1 (bottom of module) of the RXTX BOARD1 which is provided by the RF FRONTEND.
On the RXTX BOARD1, this signal is taken via a switchable attenuator with fine stepping and large attenuation range in order to match the level according to the level applied.
Subsequently, this signal is converted to an IF frequency of 10.7 MHz by means of triple signal conversion (IF1, IF2, IF3) and several filter and amplifier stages and provided at the MMCX connector IF3RX1 (top of module) for the DIGITAL BOARD.
This procedure is necessary to achieve a high image-frequency rejection and a high dynamic range with a simultaneously high intermodulation suppression.
For the receiver side, an extra LO1RX (local oscillator) is provided with a large tuning range and a very fine frequency resolution used for setting the receive frequency, an LO2 fixed-frequency oscillator shared with the transmitter and an extra LO3RX with a very small tuning range.
All LOs are synchronized by the MMCX connector 110.8 MHz at the bottom of the module with the reference frequency from the REFERENCE BOARD.
A further MMCX connector RESIF3RX (top of module) provides a buffered RX IF signal of 10.7 MHz which is taken to the rear of the CMU via a coax cable. This signal output can be activated via a software switch.
Besides, an MMCX connector at the top of the RXTX BOARD1 is designed as output with the second receiver IF (RESIF2RX) which can be activated via software switches.

Correction processor

The RXTX BOARD1 contains an extra correction processor with large flash PROM.
It controls all the static and dynamic settings on the RXTX BOARD1 and, as a special feature, also the attenuator pads and amplifiers of the RX and TX attenuator on the RF FRONTEND.
Besides, the correction processor permits to read out the individual module error data from the EEPROMS of the respective modules in a so-called correction procedure (automatic module data adjustment) and calculate the deviations for all possible signal paths. These deviations are stored as correction values in the flash PROM. The correction processor then sets the desired level settings, corrected by the correction values, in the flash PROM so that frequency, linearity and temperature responses of the modules are compensated for.
This ensures the excellent level accuracy of the CMU which is essential for most measurements.

Extension

The CMU 200 can be extended by a RXTX BOARD2 and thus provide a second complete transmit and receive channel.

DIGITAL BOARD

The DIGITAL BOARD constitutes the central control and measurement board which contains all circuit parts for conversion and further processing of the analog IF (receiver side) into digital I/Q values.
On the transmitter side, analog as well as digital I/Q values are modulated upon the carrier and provided as analog IF.

Design

The DIGITAL BOARD is designed as HVC 200 plug-in module. The HVC 200 cabinet is equipped with a screwed-on cover both at the front and rear to ensure optimum electrical shielding of the module.

Cooling system

The casing is provided with ventilation holes on the right and left in order to produce a large cooling flow through the module by means of the instrument fan.
This efficient cooling is necessary, since a great number of highly integrated fast digital devices is used on the module and up to eight sandwich modules can additionally be fitted so that the board is densely packed.

Control and supply

The control, bus lines and voltage supply of the DIGITAL BOARD are effected via four 96-pin and one 48-pin FUTURE-bus connectors from MOTHERBOARD1.

Function

As standard, the four sandwich boards ADC Module1, DDC Module1, TXDSP Module1 and AUC Module1 are fitted.
On the DIGITAL BOARD, all necessary clocks are generated and provided from the netclocks 1 and 2 in a clock conditioning and distribution circuit. These clocks are required for sampling, filtering and down converting the digital IF internally and for the UNIVERSAL SIGNALLING UNIT MODULE.
Besides, two programmable logic devices (FPGA) are used on the DIGITAL BOARD, which provide address decoding, interrupt control and host interfaces between ISA bus and internal circuit parts (DDC/TXDSP) as well as the control of the RF FRONTEND (via FEI^{2}C-Bus), the REFERENCE BOARD and AUDIO BOARD (via buffered ISA bus) and the RXTX BOARD1 (via serial bus). Further serial interfaces lead from the programmable logic devices to the UNIVERSAL SIGNALLING UNIT1 and vice versa.
An AD converter on the DIGITAL BOARD is used for polling the diagnostic voltages of the CMU modules, which can indicate module states and errors.

ADC MODULE1

The sandwich ADC MODULE1 is connected to the DIGITAL BOARD via a multipoint connector. In addition, it is screwed to a solid ground block to obtain a good ground connection.
The ADC MODULE1 receives the analog IF (10.7 MHz) from the RXTX BOARD1 directly via a MMCX connector (IF3RX1) and converts it into a 12-bit data stream by means of a fast AD converter.

DDC MODULE1

The sandwich DDC MODULE1 is directly plugged onto the DIGITAL BOARD via three multipoint connectors and processes the digital data stream of the receiver. In a special ASIC chip, the I/Q shaping, the matching of the data rate and the respective filtering (bandwidth shaping) of the digital data stream are produced. Then follows a DSP (RX DSP) with further evaluation of the digital I/Q data for measurement purposes. Besides, the digital I/Q data are passed on via the MOTHERBOARD1 to the LINKHANDLER MODULE for evaluation.

TXDSP MODULE1

The sandwich TXDSP MODULE1 is directly plugged onto the DIGITAL BOARD via two multipoint connectors. It contains the DSP on the transmitter side (TXDSP), which generates I/Q data according to the application and provides them to the AUC MODULE1 via two 12-bit D/A converters and several selection switches located on the DIGITAL BOARD.

AUC MODULE1

The sandwich AUC MODULE1 is directly plugged onto the DIGITAL BOARD via a multipoint connector and serves the purpose of filtering the analog I/Q data from the TXDSP MODULE1 or the LINKHANDLER MODULE depending on the position of the selection switches on the DIGITAL BOARD according to the application (bandwidth shaping) and converting it to the transmit IF (13.85 MHz) by means of an I/Q modulator. Subsequently, the transmit IF is routed via the MMCX connector (IF3TX1) on the DIGITAL BOARD to the RXTX BOARD1.

Extension

The DIGITAL BOARD can be extended by a further complete receive and transmit channel consisting of ADC MODULE2, DDC MODULE2, TXDSP MODULE2 and AUC MODULE2.

Option UNIVERSAL SIGNALLING UNIT CMU-B21

The UNIV. SIGN. UNIT MODULE is the control and measurement module which contains all circuit parts for signaling and measuring network-specific parameters.

To this end, the digital I/Q data from the DIGITAL BOARD are used on the receiver side (RX) in order to calculate test parameters.

On the transmitter side, analog network-specific I/Q data are generated and provided to the AUC MODULE1 on the DIGITAL BOARD.

Design

The UNIV. SIGN. UNIT MODULE is designed as plug-in module with two aluminum shell covers. It is equipped with a screwed-on aluminum cover both at the front and rear to allow for optimal electrical shielding of the module.

Cooling system

The casing is provided with ventilation holes on the right and left in order to produce a large cooling flow through the module by means of the instrument fan.
This efficient cooling is necessary, since a great number of highly integrated fast digital devices is used on the module and up to seven sandwich modules can additionally be fitted so that the module is densely packed.

Control and supply

The control, bus lines and voltage supply of the UNIV. SIGN. UNIT MODULE are connected via two 96-pin VG multipoint connectors from MOTHERBOARD1. Further interfaces for testing and debugging are provided on the top of the module.

Function

As standard, the UNIV. SIGN. UNIT MODULE contains the three sandwich boards DSP MODULE0, DSP MODULE1 and IQOUT MODULE.
Besides, if a very high computing power is required, two further DSP MODULES (DSP MODULE2, DSP MODULE3) and the SHARED MEMORY can be fitted.
Furthermore, a slot for the Option CMU-B52 SPEECH CODEC is provided. This option includes DSP MODULE3.
A microprocessor with peripheral equipment and two programmable logic devices (FPGA 'XILINX1' and 'XILINX2') on the UNIV. SIGN. UNIT control all the processes on the module.
An RS232 interface is available for debugging, data input and output.
Besides, an ISA bus interface is installed for control and data communication with the FRONT MODULE CONTROLLER.

DSP MODULE

The two sandwich DSP MODULES (DSP MODULE0 and DSP MODULE1) are directly inserted on the UNIV. SIGN. UNIT via four multipoint connectors. Via a FIFO device, they receive the digital I/Q data from the DIGITAL BOARD for evaluation. The signal can then be demodulated by the DSP MODULES and the demodulated data can be passed on the protocol engine running on the MC or a DSP MODULE. The DSP MODULES can also perform some measurements and the results are passed on via the ISA bus interface to the FRONT MODULE CONTROLLER.
Likewise, the DSPs cause further actions on the transmitter side (TX), e.g. change transmit frequency-settings via the FPGA 'XILINX2' and output analog I/Q data via the IQOUT MODULE.

IQOUT MODULE

The sandwich IQOUT MODULE is directly inserted on the UNIV. SIGN. UNIT via three multipoint connectors and installed in an extra shielding chamber, since it performs the digital-to-analog conversion of the I/Q data.

Option SPEECH CODEC CMU-B52

The Option SPEECH CODEC CMU-B52 (including DSP MODULE3) is also designed as sandwich module and is directly plugged onto the UNIV. SIGN. UNIT via three multipoint connectors. This option permits to read in and output analog speech signals (handsetin/out lines) via A/D and D/A converters.

Option AUDIO-GEN. + ANA. CMU-B41

The Option AUDIO-GEN. + ANA. constitutes the central AF-board which contains all circuit parts for generation of AF output and analysis of AF input signals. The Option AUDIO-GEN. + ANA. is a plug-in module in HVC design.

Design

At the top of the module, eight MMCX connectors are attached, which serve as inputs or outputs for AF and clock signals and are routed to the respective modules or the integrated front panel with appropriate coax cables. There is also a coax cable to the loudspeaker on the front panel.

Connection

The plug-in module AUDIO-GEN. + ANA. is inserted in the CMU on the right side on MOTHERBOARD2 using a 96-pin FUTURE-bus connector.

Function

The Option AUDIO-GEN. + ANA. contains one DSP MODULE, a clock generation circuit, an analog input section and an analog output section Further there is a power amplifier for the loudspeaker on this board
The DSP MODULE is a sandwich module, which controls the signal path, level and frequency of the AF output generator and also the signal path, attenuation and analysis of the AF input analyzer.
The DSP MODULE is connected via an ISA-Bus Interface to the FRONTMODULE CONTROLLER of the CMU.
The clock generation circuit gets from the REFERENCE BOARD a 27.7MHz signal over a coax cable and a MMCX connector. This signal feeds the DSP MODULE and is converted in a PLL circuit to 24.576 MHz.
Over a divider by 2 to. This clock signal divided by 2 (12.288MHz) is used for the A/D and D/A Converter IC and the serial links.

Analog Input Section

Over the BNC connectors AFIN and AUX1 at the front of the CMU and the coax cables the AF signal comes to the analog input section, which provides two independent input channels.
These two Input channels could be used as one balanced or two unbalanced channels. Over an input attenuator and an various gain amplifier per channel the AF signal comes to the A/D Converter, which sends over a serial link connection the digital values to the DSP MODULE.

Analog Output Section

For the AF-Generator the DSP MODULE sends the digital values over a serial link connection to the D/A Converter of the analog output section.
The analog output section provides two independent output channels, which could be used as one balanced or two unbalanced channels.
Over a various gain amplifier and a switchable output attenuator the AF signal comes to the MMCX connectors, which are connected via coax cables to the BNC connectors AFOUT and AUX2 at the front of the CMU.

MODULE Replacement

Caution!

Disconnect the instrument from the mains before opening the casing. Please note the safety instructions at the beginning of this manual.

When mounting the tube take care not to damage or pull off cables.

Replacing the FRONT MODULE

(see chapter 5, *spare part list, Current No. 270/275, and explosion drawing 1100.0008.01 D sheet 2*)

For replacement proceed as follows:

Opening the instrument and removing the FRONT MODULE

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD1.*
- After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD1 as follows:
  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - Lift the locking bracket of the connector on the MOTHERBOARD and remove the film cable.
  - PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - Disconnect the three ribbon cables from the MOTHERBOARD1 connector.
- Take the FRONT MODULE completely out of the CMU.
- Unscrew the two countersunk screws at the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull the option towards the front out of the FRONT MODULE.

Installing the new FRONT MODULE and completing the instrument

- Install the old Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE in a new FRONT MODULE in the reverse order.
- Install the new FRONT MODULE in the CMU in the reverse order.

  Caution: Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and plug them into the MOTHERBOARD before completely sliding the FRONT MODULE into the CMU.
- Complete the instrument without causing damage to the cables.

Putting into operation

- Connect the instrument to the mains and switch on: The built-in FRONT MODULE CONTROLLER registers on the LCD. The BIOS is factory-set to the CMU.
- If necessary, load new software to the FRONT MODULE (see chapter 4, *Firmware update*).
- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The Version Manager is started (see also chapter 4, *Firmware update*).
  The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.

  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being also performed on the modules. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and can be operated as usual.

Replacing the FRONT MODULE CONTROLLER in the FRONT MODULE

(see chapter 5, *spare part list, Current No. 450/455 and explosion drawing 1090.9244.01 D sheet 2/3*)

The FRONT MODULE CONTROLLER is incorporated in the FRONT MODULE. For replacement proceed as follows:

Opening the instrument and removing the FRONT MODULE

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD1.*
- After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD1 as follows:
  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - Lift the locking bracket of the connector on the MOTHERBOARD1 and remove the film cable.
  - PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - Disconnect the three ribbon cables from the MOTHERBOARD1 connector.
- Take the FRONT MODULE completely out of the CMU.

Removing the FRONT MODULE CONTROLLER from the FRONT MODULE

- Unscrew the two countersunk screws on the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull out the option from the FRONT MODULE towards the front.
- Place the FRONT MODULE onto a clean surface with the aluminum panel pointing downwards.
- Unscrew the four screws on the mounting plate at the top, bottom and left and carefully swing away the mounting plate towards the rear.
- Pull off the connecting cables to the LCD, DC/AC illumination converter, keyboard membrane and spinwheel.

  Note: *When pulling off the connecting cables be careful with the cable connecting to the keyboard. It is a film cable which can only be disconnected after sliding up the lock of the film cable plug. Besides, be careful with the ribbon cable connecting to the spinwheel. First loosen the locking brackets of the plug.*
- **MODEL 04**: Pull off the ribbon cable from the hard disk to the FRONT MODULE CONTROLLER and unscrew the four screws of the bracket through the rear of the aluminum panel and remove the hard disk.
- **MODEL 12**: Pull off the ribbon cable from the hard disk to the FRONT MODULE CONTROLLER.
- Disconnect the fan cable from the printed circuit board of the FRONT MODULE CONTROLLER.
- Unscrew the eleven combi screws of the FRONT MODULE CONTROLLER board and take out the FRONT MODULE CONTROLLER.

Installing the new FRONT MODULE CONTROLLER

- Carefully insert the new FRONT MODULE CONTROLLER, fasten using the eleven combi screws and reconnect the cable to the fan.
- **MODEL 04**: Carefully insert the hard disk, fasten using the four screws through the rear of the aluminum panel and reconnect the ribbon cable to the FRONT MODULE CONTROLLER.
- **MODEL 12**: Carefully reconnect the ribbon cable to the FRONT MODULE CONTROLLER.
- Replace the memory modules from the old into the new FRONT MODULE CONTROLLER (see replacing the memory modules).
- Carefully insert the cable connectors to the controller board, taking care not to reverse the polarities, and replace the mounting plate in the reverse order.

Installing the option again and completing the instruments

- Replace the old Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE in the FRONT MODULE in the reverse order.
- To install the FRONT MODULE1 in the CMU again proceed in the reverse order.

  Note: *Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and insert them on the MOTHERBOARD1 before sliding the FRONT MODULE completely into the CMU.*
- Complete the instrument without causing damage to the cables.

Putting into operation

- Connect the instrument to the mains.
- Connect the external keyboard to the keyboard connector on the rear panel of the CMU.
- Switch on the CMU.
- During startup observe the display.
- When three BEEPs can be heard, press the softkey to the left upper side of the LCD: **C:** will appear.

- **MODEL 04**:

- Insert a flash disk with the program FLASH FMR4 (this program is available on R & S Lotus Notes Service Board) in the PCMCIA slot 0 (right drive D:) or a floppy disk with the program FLASH FMR4 in the Option FLOPPY DISK DRIVE CMU-U61.
- Start program FLASH FMR4 with D:\ FLASH FM4.BAT or A:\ FLASH FM4.BAT.

- **MODEL 12**:

- Insert a flash disk with the program FLASH FMR5 (this program is available on R & S Lotus Notes Service Board) in the PCMCIA slot 0 (right drive D:) or a floppy disk with the program FLASH FMR5 in the Option FLOPPY DISK DRIVE CMU-U61.
- Start program FLASH FMR5 with D:\ FLASHFM5.BAT or A:\ FLASHFM5.BAT.

- During the programming of the flash EEPROM the CMU must not be switched off.
- When the prompt C:\ appears then switch off and on the CMU.
- Press the key *DEL* (Delete) on the external keyboard in order to get into the Setup menu.
- Choose the item DEFAULT OPTIMAL (MODEL 04) / LOAD CMU-DEFAULTS (MODEL 12) and press *ENTER*; quit with y and *ENTER*.
- Only if Option FLOPPY DISK DRIVE CMU-U61 is fitted, then choose the item Setup Standard and set FLOPPY A to '1.44 MB 3 ½'. Exit with the *ESC* key.
- Exit Bios Setup with key *ESC* and quit with y (save changes and exit) and press *ENTER*.

The CMU starts the operating software automatically, it is ready for use and can be operated as usual.

Replacing the Lithium Battery in the FRONT MODULE

(see chapter 5, *spare part list, Current No. 460* and *explosion drawing 1090.9244.01 D sheet 2/3*)

The lithium battery is accommodated on the FRONT MODULE CONTROLLER board inside the FRONT MODULE. For replacement proceed as follows:

Note: *Data in the CMOS RAM will be lost when replacing the lithium battery.*

Opening the instrument and removing the FRONT MODULE

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD1.*
- After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD1 as follows:

  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - Lift the locking bracket of the connector on the MOTHERBOARD1 and remove the film cable.
  - PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - Disconnect the three ribbon cables from the MOTHERBOARD1 connector.
- Take the FRONT MODULE completely out of the CMU.

Removing the lithium battery

- Unscrew the two countersunk screws on the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull out the option from the FRONT MODULE towards the front.
- Place the FRONT MODULE onto a clean surface with the aluminum panel pointing downwards.
- Unscrew the four screws on the mounting plate at the top, bottom and right and carefully swing away the mounting plate towards the rear.
- Pull off the connecting cables to the LCD, DC/AC illumination converter, keyboard membrane and spinwheel.

  Note: *When pulling off the connecting cables be careful with the cable connecting to the keyboard. It is a film cable which can only be disconnected after sliding up the lock of the film cable plug. Besides, be careful with the ribbon cable connecting to the spinwheel. First loosen the locking brackets of the plug.*

- Locate the lithium battery on the controller board (see chapter 5, *explosion drawing 1090.9244.01 D sheet 2/3*).
- Unplug jumper J7 (MODEL 04) and J12 (MODEL 12).
- Carefully unsolder the negative terminal from the soldering lug first using the soldering iron (medium temperature). Then unsolder the positive terminal. If necessary, remove the mechanical lock (cable clamp) and take out the battery.

  Note: *The lithium battery is of the type 3.4 V (∅ 15mm * 25mm) with soldering lug terminals (spare part list, Current No. 460).*

Caution!

Lithium batteries must not be exposed to high temperatures or fire.

Keep away from children.

If the battery is replaced improperly, there is danger of explosion. Only replace the battery by R&S type (spare part list, Current No. 460).

Lithium batteries are hazardous waste and must be disposed of in dedicated containers.

Do not short-circuit the battery!

Installing the new battery and completing the instrument

- Shorten the length of the connecting wires of the new battery as with the old battery and replace with the correct polarity.

  Note: *Do not short-circuit the battery!*

- If necessary, replace the mechanical lock (cable clamp). First solder the positive terminal to the PC board, then the negative terminal.
- **MODEL 04**: Plug jumper J7 first to the position middle and right (position RAM discharge) and then to middle and left position. Leave jumper J7 at this position (position before battery replacement).
- **MODEL 12**: Plug jumper J12 first to the position middle and left (position RAM discharge) and then to middle and right position. Leave jumper J12 at this position (position before battery replacement).
- Carefully plug the cable connectors to the controller board without reversing the polarities and replace the mounting plate in the reverse order.
- Install the old Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE in the FRONT MODULE in the reverse order.
- Install the FRONT MODULE in the CMU in the reverse order.

  Note: *Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and insert them on the MOTHERBOARD1 before sliding the FRONT MODULE completely into the CMU.*

- Complete the instrument without causing damage to the cables.

Putting into operation

- Connect the instrument to the mains.
- Connect the external keyboard to the keyboard connector on the rear panel of the CMU.
- Switch on the CMU.
- Press the key DEL (Delete) on the external keyboard in order to get into the Setup menu
- Choose the item DEFAULT OPTIMAL (MODEL 04) / LOAD CMU-DEFAULTS (MODEL 12) and press *ENTER*; quit with y and *ENTER*.
- Choose the item Setup Standard and set date and time. Exit with *ESC* key.
- Exit BIOS Setup with the key *ESC* and quit with y (save changes and exit) and ENTER.

The CMU starts the operating software automatically, it is ready for use and can be operated as usual.

Replacing the Hard Disk in the FRONT MODULE

(see chapter 5, *spare part list, Current No. 490* and *495* and *explosion drawing 1090.9244.01 D*)

The hard disk is incorporated in the FRONT MODULE (MODULE 04) or outside on the back of the aluminum panel of the FRONT MODULE (MODEL 12). For replacement proceed as follows:

Opening the instrument and removing the FRONT MODULE

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.

Only MODEL 04:

- Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- After unscrewing the two countersunk screws at the top left instrument frame, slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD.*

- After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD1 as follows:

  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - Lift the locking bracket of the connector on the MOTHERBOARD1 and remove the film cable.
  - Option PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - Disconnect the three ribbon cables from the MOTHERBOARD1 connector.

- Take the FRONT MODULE completely out of the CMU.

Removing the hard disk from the FRONT MODULE

MODEL 04:

- Unscrew the two countersunk screws on the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull out the option from the FRONT MODULE towards the front.
- Place the FRONT MODULE onto a clean surface with the aluminum panel pointing downwards.
- Unscrew the four screws on the mounting plate at the top, bottom and right and carefully swing away the mounting plate towards the rear.
- Pull off the connecting cables to the LCD, DC/AC illumination converter, keyboard membrane and spinwheel.

  Note: *When pulling off the connecting cables be careful with the cable connecting to the keyboard. It is a film cable which can only be disconnected after sliding up the lock of the film cable plug. Besides, be careful with the ribbon cable connecting to the spinwheel. First loosen the locking brackets of the plug.*
- Remove the ribbon cable from the hard disk to the FRONT MODULE CONTROLLER, unscrew the four screws of the bracket through the rear of the aluminum panel and take out the hard disk.

MODEL 12:

- After unscrewing the two countersunk screws at the top left instrument frame, slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Remove the ribbon cable from the hard disk to the FRONT MODULE CONTROLLER, unscrew the two screws on the back of the aluminum panel of the FRONT MODULE and pull out the harddisk. Unscrew the hard disk from the disk holder.

Installing the new hard disk

MODEL 04:

- Carefully insert the new hard disk, fasten with the four screws of the bracket through the rear of the aluminum panel and connect the ribbon cable to the FRONT MODULE CONTROLLER.

  Note: *The hard disk is an IDE hard disk which can be obtained under R&S spare part list, Current No. 490. It is already formatted for the CMU and contains the operating system.*
- Carefully plug the cable connectors to the controller board without reversing the polarities and replace the mounting plate in the reverse order.

Only MODEL 04: Installing the option again and completing the instrument

- Install the old Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE in the FRONT MODULE in the reverse order.
- Then install the FRONT MODULE in the CMU in the reverse order.

  Note: *Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and insert them on the MOTHERBOARD1 before sliding the FRONT MODULE completely into the CMU.*
- Complete the instrument without causing damage to the cables.

MODEL 12:

- Carefully fit the new hard disk, fasten with the four screws to the disk holder. Insert the hard disk with the disk holder on the back of the aluminum case of the FRONT MODULE. Be careful with the lower cover plate locking in the concerning opening.
  Connect the ribbon cable to the FRONT MODULE CONTROLLER. Fit the disk holder with two screws to the aluminum panel of the FRONT MODULE.
- Complete the instrument without causing damage to the cables.

Putting into operation

- Connect the instrument to the mains and switch on: The built-in *FRONT MODULE CONTROLLER* registers on the LCD. The BIOS is factory-set to the CMU, the new hard disk is automatically detected.
- Install the new software (see chapter 4, *Firmware update*).

Replacing the Memory Modules in the FRONT MODULE

(see chapter 5, *spare part list, Current No. 470* or *480 (MODEL 04)*
Current No. 475 or 485 (MODEL 12) and *explosion drawing 1090.9244.01 D sheet 2/3*)

The memory modules are incorporated in the FRONT MODULE. The FRONT MODULE CONTROLLER features two SIMM-72 slots, in each of which up to 32 MB memory can be fitted (MODEL 04) or two SODIMM-144 slots, in each of which up to 64 MB memory can be fitted (MODEL 12). The BIOS automatically detects the size of the memory modules. For replacement proceed as follows:

Opening the instrument and removing the FRONT MODULE

- ➢ Switch off the instrument, pull the power plug, unscrew the rear-panel feet.
- ➢ Place the instrument onto the front carrying handles, push the tube upwards and take off.
- ➢ Unscrew the four screws of the front handles from the instrument frame on both sides and take off the front handles.
- ➢ Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- ➢ Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- ➢ Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- ➢ After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- ➢ Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD1.*
- ➢ After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD as follows:
  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - ➢ Lift the locking bracket of the connector on the MOTHERBOARD1 and remove the film cable.
  - PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - ➢ Disconnect the three ribbon cables from the MOTHERBOARD1 connector.
- ➢ Take the FRONT MODULE completely out of the CMU.

Making the memory modules accessible

- Unscrew the two countersunk screws on the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull out the option from the FRONT MODULE towards the front.
- Place the FRONT MODULE onto a clean surface with the aluminum panel pointing downwards.
- Unscrew the four screws on the mounting plate at the top, bottom and right and carefully swing away the mounting plate towards the rear.
- Pull off the connecting cables to the LCD, DC/AC illumination converter, keyboard membrane and spinwheel.

Note: *When pulling off the connecting cables be careful with the cable connecting to the keyboard. It is a film cable which can only be disconnected after sliding up the lock of the film cable plug. Besides, be careful with the ribbon cable connecting to the spinwheel. First loosen the locking brackets of the plug.*

Removing the memory module

- Remove the old module: Carefully bend the lateral brackets towards the outside and pull out the memory module.

Installing the new memory module and completing the instrument

- Insert the new module: insert the memory module into the slot, slightly press towards the rear and engage the brackets on the sides.

Note: ***MODEL 04****: The memory modules can be obtained with the size 16 MB (spare part list, Current No. 470) and 32 MB (spare part list, Current No. 480). It is possible to insert two of these modules, even of different size. First fit slot 1 (U35) and then slot 2 (U36).*

MODEL 12*: The memory modules can be obtained with the size 32 MB (spare part list, Current No. 475) and 64 MB (spare part list, Current No. 485). It is possible to insert two of these modules, even of different size. It is not recommended to fit more than 64 MB in sum. First fit slot 1 (U24) and then slot 2 (U25).*

- Carefully plug the cable connectors to the controller board without reversing the polarities and replace the mounting plate in the reverse order.
- Install the old Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE in the FRONT MODULE in the reverse order.

Note: *Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and insert them on the MOTHERBOARD before sliding the FRONT MODULE completely into the CMU.*

- Complete the instrument without causing damage to the cables.

Putting into operation

- Connect the instrument to the mains and switch on. The built-in FRONT MODULE CONTROLLER registers on the LCD. The BIOS is factory-set to the CMU.

- If required, supplement the BIOS Setup as follows:
  - Connect external keyboard to keyboard connector on the rear panel of the CMU.
  - If the message 'CMOS Memory Size wrong, RUN SETUP, Press F1 to resume' appears, press the F1 key.
  - Quit the BIOS setup using the ESC key and the RETURN key.

The CMU starts the operating software automatically and is ready for use and can be operated as usual.

Replacing the LCD and/or DC/AC Converter in the FRONT MODULE

(see chapter 5, *spare part list, LCD: Current No. 360/365, DC/AC Converter: Current No. 410/415* and *explosion drawing 1090.9244.01 D sheet 2/3*)

The LCD is accommodated on the mounting plate of the FRONT MODULE together with the associated DC/AC converter. It is connected to the FRONT MODULE CONTROLLER via cables, which can also be replaced individually. For replacement proceed as follows:

Opening the instrument and removing the FRONT MODULE

- ➢ Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- ➢ Place the instrument onto the front carrying handles, push the tube upwards and take off.
- ➢ Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- ➢ Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- ➢ Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- ➢ Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- ➢ After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- ➢ Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD1.*

- ➢ After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD1 as follows:
  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - ➢ Lift the locking bracket of the connector on the MOTHERBOARD1 and remove the film cable.
  - PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - ➢ Disconnect the three ribbon cables from the MOTHERBOARD1 connector.
- ➢ Take the FRONT MODULE completely out of the CMU.

Making the LCD accessible

- Unscrew the two countersunk screws on the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull out the option from the FRONT MODULE towards the front.
- Place the FRONT MODULE onto a clean surface with the aluminum panel pointing downwards.
- Unscrew the four screws on the mounting plate at the top, bottom and right and carefully swing away the mounting plate towards the rear.
- Pull off the connecting cables to the LCD, DC/AC illumination converter, keyboard membrane and spinwheel.

Note: *When pulling off the connecting cables be careful with the cable connecting to the keyboard. It is a film cable which can only be disconnected after sliding up the lock of the film cable plug. Besides, be careful with the ribbon cable connecting to the spinwheel. First loosen the locking brackets of the plug.*

Removing the LCD and/or DC/AC Converter

- Unscrew the two screws of the DC/AC converter shielding and pull off the plug of the connecting cable to the DC/AC converter.
- If required, unscrew the two screws of the DC/AC converter and loosen the connecting cable to the FRONT MODULE CONTROLLER.
- Remove the DC/AC converter.
- Loosen the four screws of the LCD shielding and take off the shielding.

Warning!

If there are spacing pieces under the LCD shielding, use them again for installation.

- Loosen the connecting cable to the FRONT MODULE CONTROLLER by unscrewing the two screws and remove.
- Unscrew the four screws of the LCD on the mounting plate and remove the LCD.

Installing the new LCD and/or DC/AC converter and completing the instrument

- Insert new LCD and/or DC/AC converter in the reverse order, connect all connecting cables in the correct position and replace all screws.
- Carefully plug the cable connectors to the controller board without reversing the polarities and replace the mounting plate in the reverse order.
- Replace the old Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE in the FRONT MODULE in the reverse order.

  Note: *Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and insert them on the MOTHERBOARD before sliding the FRONT MODULE completely into the CMU.*
- Complete the instrument without causing damage to the cables.

Putting into operation

- Connect the instrument to the mains and switch on.

The built-in front-module controller registers on the LCD and starts the operating software.

Replacing the Keyboard Membrane and/or Mat on the FRONT MODULE

(see chapter 5, *spare part list, Current No. 290 (Keyboard Mat) / 300 (Keyboard Membrane)* and *explosion drawing 1090.9244.01 D sheet 2/3*)

The keyboard membrane is the contact film for the rubber keys (mat) behind the labeling panel and the keyboard frame. For replacement proceed as follows:

Opening the instrument and removing the FRONT MODULE

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD1.*

- After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD1 as follows:
  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - Lift the locking bracket of the connector on the MOTHERBOARD1 and remove the film cable.
  - PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - Disconnect the three ribbon cables from the MOTHERBOARD1 connector.
- Take the FRONT MODULE completely out of the CMU.

Removing the membrane

- Unscrew the two countersunk screws on the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull out the option from the FRONT MODULE towards the front.
- Place the FRONT MODULE onto a clean surface with the aluminum panel pointing downwards.
- Unscrew the four screws on the mounting plate at the top, bottom and right and carefully swing away the mounting plate towards the rear.
- Pull off the connecting cables to the LCD, DC/AC converter, membrane and spinwheel.

  Note: *When pulling off the connecting cables be careful with the cable connecting to the keyboard. It is a film cable which can only be disconnected after sliding up the lock of the film cable plug. Besides, be careful with the ribbon cable connecting to the spinwheel. First loosen the locking brackets of the plug.*
- Place the mounting plate onto the surface with the keyboard frame pointing upwards and unscrew the 10 countersunk screws of the keyboard frame.
- Pull off the knob of the spinwheel.
- Lift off the keyboard frame as well as the mat which is now accessible.
- Lift off the membrane and pull the connecting cable through the hole of the mounting plate.

Installing the new membrane and completing the instrument

- Insert the new membrane and/or mat in the reverse order, insert the mat at the correct position (observe the labeling of the keys!) and fasten the keyboard frame with screws.
- Carefully plug the cable connectors to the controller board without reversing the polarities and replace the mounting plate in the reverse order.
- Install the old Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE in the FRONT MODULE in the reverse order.
- Install the FRONT MODULE in the CMU in the reverse order.

  Note: *Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and insert them on the MOTHERBOARD1 before sliding the FRONT MODULE completely into the CMU.*
- Complete the instrument without causing damage to the cables.

Putting into operation

- Connect the instrument to the mains and switch on.

The built-in FRONT MODULE CONTROLLER registers on the LCD and starts the operating software.

Replacing the Labeling Panel on the FRONT MODULE

(see chapter 5, *spare part list, Current No. 260* and *explosion drawing 1100.0008.01 D sheet 2*)
The labeling panel is the outer front panel which carries the labeling of all the parts on the front side of the CMU. For replacement proceed as follows:

Removing the old labeling panel

- Switch off the instrument and pull the mains plug.
- Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.

Installing the new labeling panel and completing the instrument

- Install the new labeling panel and tighten all screws.
- Complete the instrument.

Putting into operation

- Connect the instrument to the mains and switch on.

The built-in FRONT MODULE CONTROLLER registers on the LCD and starts the operating software.

Replacing the Options FLOPPY DISK DRIVE CMU-B61 or PCMCIA INTERFACE

(see chapter 5, *spare part list, Current No. 780 (FLOPPY DISK DRIVE)* and *830 (PCMCIA INTERFACE,* and *explosion drawing 1100.0008.01 D sheet 2*)

The options FLOPPY DISK DRIVE or PCMCIA INTERFACE are fitted on the FRONT MODULE. For replacement proceed as follows:

Opening the instrument and removing the FRONT MODULE

- ➢ Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- ➢ Place the instrument onto the front carrying handles, push the tube upwards and take off.
- ➢ Unscrew the four screws of the front handles at the instrument frame on both sides and take off the front handles.
- ➢ Unscrew a countersunk screw (if present) at the front on the labeling panel next to the spinwheel and pull off the labeling panel towards the front.
- ➢ Unscrew two countersunk screws in the front frame at the top and at the bottom as well as two countersunk screws at the front above the AUX1/2 BNC connectors.
- ➢ Unscrew a combi screw at the top of the module support for support of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE.
- ➢ After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- ➢ Slightly push the FRONT MODULE from the rear to the front using little pressure.

  Note: *Note the connecting cables for the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE that are still connected to the MOTHERBOARD1.*

- ➢ After sliding out the FRONT MODULE disconnect the respective connecting cable for the option from the MOTHERBOARD1 as follows:
  - Option FLOPPY DISK DRIVE CMU–U61: The connecting cable is a film cable.
    - ➢ Lift the locking bracket of the connector on the MOTHERBOARD1 and remove the film cable.
  - PCMCIA INTERFACE: The connecting cable consists of three ribbon cables.
    - ➢ Disconnect the three ribbon cables from the MOTHERBOARD1 connector.
- ➢ Take the FRONT MODULE completely out of the CMU.

Replacing the option

- Unscrew the two countersunk screws on the cover of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE and carefully pull out the option from the FRONT MODULE towards the front.
- Option FLOPPY DISK DRIVE: Unscrew the countersunk screws on the frame of the FLOPPY DISK DRIVE and take out the FLOPPY DISK DRIVE.
- Install the new FLOPPY DISK DRIVE or PCMCIA INTERFACE in the FRONT MODULE in the reverse order.
- Install the FRONT MODULE in the CMU in the reverse order.

Note: *Make sure to route the cables of the Option FLOPPY DISK DRIVE CMU–U61 or PCMCIA INTERFACE properly, not to catch them and insert them on the MOTHERBOARD1 before sliding the FRONT MODULE completely into the CMU.*

Completing the instrument and putting into operation

- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

- If the Option FLOPPY DISK DRIVE CMU-B61 is replaced by PCMCIA INTERFACE, the following BIOS setup modification will be necessary:
  - Connect the external keyboard to the keyboard connector at the rear of the CMU.
  - Switch the CMU off and on.
  - Press the hardkey 'Delete' at the external keyboard to get in the BIOS setup.
  - Select *Setup* with cursor keys and confirm with *ENTER*.
  - Select 'Floppy A' with cursor keys and confirm with *ENTER*.
  - Select 'Not installed' with cursor keys and confirm with *ENTER*.
  - Quit BIOS Setup by pressing twice the hardkey *ESC* and confirm with *ENTER*. The CMU starts automatically.

- If PCMCIA INTERFACE is replaced by the Option FLOPPY DISK DRIVE CMU-B61, the following BIOS Setup modification will be necessary:
  - Connect the external keyboard to the keyboard connector at the rear of the CMU.
  - Switch the CMU off and on.
  - Press the hardkey 'Delete' at the external keyboard to get in the BIOS Setup.
  - Select *Setup* with cursor keys and confirm with *ENTER*.
  - Select 'Floppy A' with cursor keys and confirm with *ENTER*.
  - Select '1.44 MB 3 ½' with cursor keys and confirm with *ENTER*.
  - Quit BIOS Setup by pressing twice the hardkey *ESC* and confirm with *ENTER*. The CMU starts automatically.

The built-in FRONT MODULE CONTROLLER registers on the LCD and starts the operating software.

Replacing the RF FRONTEND

(see chapter 5, *spare part list, Current No. 520* and *explosion drawing 1100.0008.01 D sheet 2*)

The RF FRONTEND is installed at the bottom of the CMU at the front right. For replacement proceed as follows:

Opening the instrument and removing the RF FRONTEND

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Place the instrument upside down to make the bottom accessible.
- Pull off the ribbon cable to the MOTHERBOARD on the RF FRONTEND. Completely unscrew RF SMA coax cables to the RXTX BOARD1 (if present, also those to the RXTX2 BOARD and RXTXAUX1/2 connectors) on the RF FRONTEND and RXTX BOARD1 using a special wrench*.
- Unscrew the two countersunk screws at the bottom front of the front frame and one countersunk screw on the side panel of the CMU for supporting the RF FRONTEND.
- Pull the RF FRONTEND approx. 20 mm towards the rear and then swing towards the bottom.

Installing the new RF FRONTEND MODULE and completing the instrument

- Insert the RF FRONTEND into the instrument in the reverse order and connect all cables.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications, except for the level accuracy.
In order to achieve the level accuracy described in the data sheet, a so-called path error data record is necessary.
To this end, the CMU must be measured using the test system ACS 100 (see chapter 1, *Performance Test*).

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Replacing the REFERENCE BOARD

(see chapter 5, *spare part list, Current No. 540* and *explosion drawing 1100.0008.01 D sheet 2*)

The REFERENCE BOARD is installed at the front right top of the CMU as plug-in module in the cage. For replacement proceed as follows:

Opening the instrument and removing the REFERENCE BOARD

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Unscrew the combi screw from the locking bracket of the module in the vicinity of the instrument fan and fold up.
- Pull off all MMCX plug-in cables (using a pull-out tool*) from the top of the REFERENCE BOARD and pull out the module towards the top with the help of the locking bracket.

Installing the new REFERENCE BOARD and completing the instrument

- Insert the new REFERENCE BOARD in the instrument in the reverse order and connect all MMCX plug-in cables.
- Perform manual adjustment +5 VDC reference voltage and TCXO adjustment as described in chapter 2.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.
  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications.

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Replacing the RXTX BOARD1

(see chapter 5, *spare part list, Current No. 550* and *explosion drawing 1100.0008.01 D sheet 2*)

The RXTX BOARD1 is installed in the module support as plug-in module. For replacement proceed as follows:

Opening the instrument and removing the RXTX BOARD1

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After unscrewing the two countersunk screws at the top left instrument frame, slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Place the instrument to the left side and unscrew the two RF SMA coax cables at the bottom of the RXTX BOARD1 using a special wrench*. Likewise pull off the MMCX plug-in cable (using a pull-out tool*) from the bottom.
- Pull off all MMCX plug-in cables from the top of the RXTX1 BOARD and pull out the board using the two levers on both sides.

Installing the new RXTX BOARD1 and completing the instrument

- Insert the new RXTX BOARD1 into the instrument in the reverse order and carefully connect all the MMCX plug-in and RF SMA coax cables.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications, except for the high-precision level accuracy.
In order to achieve the level accuracy as described in the data sheet, a so-called path error data record is necessary.
To this end, the CMU must be measured using the test system ACS 100 (see chapter 1, *Performance Test*).

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Replacing the TR-CORRECTION MODULE in the RXTX BOARD1

(see chapter 5, *spare part list, Current No. 555* and *explosion drawing 1100.0008.01 D*)

The TR-CORRECTION MODULE is incorporated in the RXTX1 BOARD as sandwich module. For replacement proceed as follows:

Opening the instrument and removing the TR-CORRECTION MODULE

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After unscrewing the two countersunk screws at the top left instrument frame, slightly lift the cover at the instrument top, slightly push to the right and lift off.
- Place the instrument to the left side and unscrew the two RF SMA coax cables at the bottom of the RXTX BOARD1 using a special wrench. Likewise, pull off the MMCX plug-in cable at the bottom.
- Pull off all the MMCX plug-in cables (using a pull-out tool*) from the top of the RXTX BOARD1 and pull off the module towards the top using the two levers on the right and left.
- Unscrew one screw of each cooling plate, pull off the cooling plates towards the side and then unscrew all screws of the RXTX aluminum cover shells. Then the cover shells of the top and bottom can be removed.
- Pull off the sandwich module TR-CORRECTION MODULE (using a pull-out tool*) from the RXTX BOARD1.

Installing the new TR-CORRECTION BOARD and completing the instrument

- Insert the new TR-CORRECTION MODULE.
- Reinsert the cover shells in the reverse order and fasten with screws. Attach the cooling plates again.
- Insert the RXTX BOARD1 into the instrument in the reverse order and carefully connect all the MMCX plug-in cables and RF-SMA coax cables.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications, except for the high-precision level accuracy.
In order to achieve the level accuracy as described in the data sheet, a so-called path error data record is necessary.

To this end, the CMU must be measured using the test system ACS 100 (see chapter 1, *Performance Test*).

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Replacing the DIGITAL BOARD

(see chapter 5, *spare part list, Current No. 570* and *explosion drawing 1100.0008.01 D sheet 2*)

The DIGITAL BOARD is incorporated in the module support as plug-in module. For replacement proceed as follows:

Opening the instrument and removing the DIGITAL BOARD

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After unscrewing the two countersunk screws at the top left instrument frame, slightly lift the cover at the instrument top, slightly push to the right and lift off.
- Pull off all the MMCX plug-in cables (using a pull-out tool*) from the top of the DIGITAL BOARD and pull off the module towards the top using the two levers on the right and left.

Installing the new DIGITAL BOARD and completing the instrument

- Insert the new DIGITAL BOARD into the instrument in the reverse order and connect all the MMCX plug-in cables.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications, except for the high-precision level accuracy.
In order to achieve the level accuracy as described in the data sheet, a so-called path error data record is necessary.
To this end, the CMU must be measured using the test system ACS 100 (see chapter 1, *Performance Test*).

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Replacing the MODULES: ADC MODULE1, DDC MODULE1, TXDSP MODULE1, AUC MODULE1 in the DIGITAL BOARD

(see chapter 5, *spare part list, Current No. 590 (ADC MODULE1), Current No. 580 (DDC MODULE1), Current No. 600 (TXDSP MODULE1), Current No. 610 (AUC MODULE1)* and *explosion drawing 1100.1791.01 D sheet 2*)

The sandwich modules ADC MODULE1, DDC MODULE1, TXDSP MODULE1 and AUC MODULE1 are installed in the DIGITAL BOARD as plug-in modules. For replacement proceed as follows:

Opening the instrument and removing the modules

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After unscrewing the two countersunk screws at the top left instrument frame, slightly lift the cover at the instrument top, slightly push to the right and lift off.
- Pull off all the MMCX plug-in cables (using a pull-out tool*) from the top of the DIGITAL BOARD and pull off the module towards the top using the two levers on the right and left.
- Remove the cover of the higher HVC side (B-side) by loosening the cover screws.
- Carefully lever out the respective sandwich module (using a pull-out tool*) in the case of the ADC MODULE loosen the two fixing screws before.

Installing the new sandwich module and completing the instrument

- Replace by a new module.

Caution!

Take care to insert the module at the correct position.

The heat conducting mats have to be stuck to the components of the modules (see chapter 5, drawing 1100.1791.01 D sheet 2).

- Insert the DIGITAL BOARD into the instrument in the reverse order and connect all the MMCX plug-in cables.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.
  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications, except for the high-precision level accuracy.
In order to achieve the level accuracy as described in the data sheet, a so-called path error data record is necessary.
To this end, the CMU must be measured using the test system ACS 100 (see chapter 1, *Performance Test*).

Replacing the Option OCXO REFERENCE OSC. CMU-B11 or CMU-B12

*(*see chapter 5, *spare part list, Current No. 690 (OCXO REFERENCE OSC. CMU-B11), 710 (OCXO REFERENCE OSC. CMU-B12)* and *explosion drawing 1100.0008.01 D sheet 2)*

The Option OCXO REFERENCE OSC. is fitted at the right side panel below the instrument fan in the CMU. For replacement proceed as follows:

Opening the instrument and removing the OPTION OCXO REFERENCE OSC.

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Place the instrument onto the left side, locate the OPTION OCXO *(see chapter 5, explosion drawing 1100.0008.01 D sheet 2)* and unscrew the two combi screws on the module support and one combi screw on the MOTHERBOARD1.
- Pull off OPTION OCXO REFERENCE OSC. from the MOTHERBOARD1 connector, slightly tilt and swing out towards the bottom.

Installing the new OPTION OCXO REFERENCE OSC. and completing the instrument

- Install the new OPTION OCXO REFERENCE OSC. in the reverse order. Tighten the three combi screws again.

  Note: *Make sure that the 10-pin connector to the MOTHERBOARD is inserted correctly.*
- Complete the instrument without causing damage to the cables.

Manual OCXO adjustment

- Connect the instrument to the mains and switch on.
- Check the frequency accuracy and, if necessary, perform manual OCXO adjustment as described in chapter 2.

Replacing the Option UNIVERSAL SIGNALLING UNIT CMU-B21

(see chapter 5, *spare part list, Current No. 730 and explosion drawing 1100.0008.01 D sheet 2*)

The OPTION UNIV. SIGN. UNIT is installed in the module support as plug-in module. For replacement proceed as follows:

Opening the instrument and removing the OPTION UNIV. SIGN. UNIT

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Take out the module using the two levers on the right and left.

Installing the new OPTION UNIV. SIGN. UNIT and completing the instrument

- Insert the new OPTION UNIV. SIGN. UNIT into the instrument in the reverse order.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications.

Replacing the MODULES: DSP MODULE0/1, IQOUT MODULE, OPTION SPEECH CODEC CMU-B52 (INCLUDES DSP MODULE3) in the UNIV. SIGN. UNIT

(see chapter 5, *spare part list, Current No. 740 (DSP MODULE0), 741 (DSP MODULE1), 760 (SPEECH CODEC), 765 (DSP MODULE3), 750 (I/Q OUT MODULES)* and *explosion drawing 1100.5216.01 D sheet 2*)

The sandwich modules DSP MODULE0, DSP MODULE1, IQOUT MODULE and OPTION SPEECH CODEC CMU-B52 (includes DSP MODULE3) are installed in the UNIV. SIGN. UNIT as plug-in modules. For replacement proceed as follows:

Opening the instrument and removing the modules

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Take out the module using the two levers on the right and left.
- Take off the cover on the higher side (B-side) by loosening the cover screws.
- Carefully lever out the respective sandwich module (using a pull-out tool*) (see chapter 5, *drawing 1100.5216.01 D sheet 2*).

Installing the new sandwich module and completing the instrument

- Replace by new module.

Caution!

Take care to insert the respective module (DSP MODULE0 and DSP MODULE1 modules are of the same design) with the correct polarity (see chapter 5, drawing 1100.5216.01 sheet 2).

- Replace the cover and fasten with screws.
- Insert the Option UNIV. SIGN. UNIT into the instrument in the reverse order.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.
  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications.

Replacing the Option AUDIO-GEN. + ANA. CMU-B41

(see chapter 5, *spare part list, Current No. 755 and 756* and *explosion drawing 1100.0008.01 D sheet 2*)

The Option AUDIO-GEN. + ANA. is installed at the front right top of the CMU as plug-in module in the cage. For replacement proceed as follows:

Opening the instrument and removing the Option AUDIO-GEN. + ANA.

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Unscrew the combi screw from the locking bracket of the module in the vicinity of the instrument fan and fold up.
- Pull off all MMCX plug-in cables (using a pull-out tool*) from the top of the Option AUDIO-GEN. + ANA. and pull out the module towards the top with the help of the locking bracket.

Installing the new Option AUDIO-GEN. + ANA. and completing the instrument

- Insert the new Option AUDIO-GEN. + ANA. in the instrument in the reverse order and connect all MMCX plug-in cables.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.
  The version manager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well. This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications.

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

Replacing the POWER SUPPLY

*(*see chapter 5, *spare part list, Current No. 670* and *explosion drawing 1100.0008.01 D sheet 2)*

The POWER SUPPLY is fitted at the rear of the instrument frame of the CMU. For replacement proceed as follows:

Removing the POWER SUPPLY

- Switch off the instrument and pull the mains plug.
- Unscrew the ten screws at the rear of the POWER SUPPLY. Pull out the power supply approx. 10 mm to 20 mm towards the rear, slightly tilt towards the bottom and then pull out completely.

Installing the new POWER SUPPLY

- Install the new POWER SUPPLY in the reverse order.

  Note: *Make sure that the 96-pin connector to the MOTHERBOARD1 locks in place correctly.*
- Connect the instrument to the mains and switch on.

Replacing the Instrument Fan

(see chapter 5, spare part list, Current No. 80, and explosion drawing 1100.0008.01 D sheet 2)

The fan is fitted at the right side panel of the CMU in an air duct. For replacement proceed as follows:

Opening the instrument and removing the fan

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Place the instrument onto the left side and locate the fan connecting cable. Coming from the air duct, the cable leads to connector X211 at MOTHERBOARD1 near the Option OCXO REFERENCE OSC.. If this is installed, it can as well be removed in order to enable easier access to the fan connector (see replacing the OPTION OCXO REFERENCE OSC.).
- Pull off the connector from MOTHERBOARD1. To this end, press the locking lever at the top of the connector towards the connector and lift off the cable.
- Lever off the cover of the air duct and unscrew the four countersunk screws of the fan in the right side panel of the CMU. Carefully take out the fan towards the top and pull the connecting cable through the hole in the air duct (Take off the adhesive tapes of the cable entry and keep them for later).

Installing the new fan and completing the instrument

- Replace the new fan in the reverse order.

  Note: *Make sure that the air direction of the fan is such that air is sucked in from the right side of the CMU and pressed through the air duct. Note the arrows on the fan casing.*
- Reconnect the fan connecting cable to MOTHERBOARD1 (Fix again the adhesive tapes of the cable entry).
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Replacing the MOTHERBOARD

(see chapter 5, spare part list, Current No. 620 (MOTHERBOARD1), Current No. 630 (MOTHERBOARD2), Current No. 660 (FRONTPANEL BOARD), Current No. 640 (REARPANEL BOARD1), Current No. 650 (REARPANEL BOARD2) and explosion drawing 1100.0008.01 D)

The MOTHERBOARD consists of five parts: MOTHERBOARD1, MOTHERBOARD2, FRONTPANEL BOARD, REARPANEL BOARD1 and REARPANEL BOARD2.
For replacement of the individual parts proceed as follows:

MOTHERBOARD1 (big MOTHERBOARD)

Opening the instrument and removing MOTHERBOARD1

- Switch off the instrument, pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After unscrewing the two countersunk screws at the top left instrument frame slightly lift the cover at the top of the instrument, slightly shift towards the right and lift off.
- Loosen all connecting cables to the boards, then lever out all boards as described above using the two levers at the right and at the left.
- Likewise, remove the POWER SUPPLY and the FRONT MODULE, disconnect the ribbon cable connections to the RF-FRONTEND, MOTHERBOARD2, FRONTPANEL BOARD, REARPANEL BOARD1 and REARPANEL BOARD2. Disconnect the fan connecting cable and remove the Option OCXO REFERENCE OSC, if installed.
- Remove the partition inserted between air duct and module support as reinforcement by unscrewing the four screws.
- Place the instrument upside down and unscrew all the five combi screws on MOTHERBOARD1, then slightly shift MOTHERBOARD1 towards the rear until the six motherboard supports slide out of the keyholes. Then swing out MOTHERBOARD1 towards the top.

Installing the new MOTHERBOARD1 and completing the instrument

- Insert new MOTHERBOARD1 and connect all connectors and modules in the reverse order.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

MOTHERBOARD2 (small MOTHERBOARD)

Opening the instrument and removing MOTHERBOARD2

- Switch off the instrument and pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Unscrew the combi screw of the module locking bracket near the instrument fan and swing away the locking bracket towards the top.
- Disconnect all the MMCX plug-in cables (using a pull-out tool*) from the top of the REFERENCE BOARD and pull off the module.
- If installed, remove any other optional module next to the REFERENCE BOARD.
- Disconnect the two ribbon cables from the MOTHERBOARD2. Unscrew the four screws from MOTHERBOARD2 and take out.

Installing the new MOTHERBOARD2 and completing the instrument

- Replace new MOTHERBOARD2, fasten with screws and connect all connectors and modules in the reverse order.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

FRONTPANEL BOARD (at the front of the instrument frame)

Opening the instrument and removing the FRONTPANEL BOARD

- Switch off the instrument and pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Remove the FRONT MODULE as described above.
- Unscrew the four countersunk screws of part of the mounting plate in the front frame at the bottom and the top, loosen the two ribbon cables from MOTHERBOARD1 and the MMCX coax cables (using a pull-out tool*) on the option (if installed) next to the REFERENCE BOARD.
- Loosen all interface screws on part of the mounting plate and take out the FRONTPANELBOARD.

Installing the new FRONTPANEL BOARD and completing the instrument

- Install new FRONTPANEL BOARD, fasten with screws and connect all connectors and modules in the reverse order.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

* available in CMU-Service Kit CMU-Z3 (1100.7690.02)

REARPANEL BOARD1 (Interface board for Standard Connectors at the Rear of the Instrument Frame)

Opening the instrument and removing the REARPANEL BOARD1

- Switch off the instrument and pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Place the instrument onto the left side.
- Pull off the two ribbon cables of the REARPANEL BOARD1 on MOTHERBOARD1.
- Loosen all interface screws on the integrated rear panel below the POWER SUPPLY and take out the REARPANEL BOARD1.

Installing the new REARPANEL BOARD1 and completing the instrument

- Install new REARPANEL BOARD1, fasten with screws and connect all connectors in the reverse order.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

REARPANEL BOARD2 (Interface Board for Further Connectors at the Rear of the Instrument Frame)

Opening the Instrument and removing the REARPANEL BOARD2

- Switch off the instrument and pull the mains plug and unscrew the rear-panel feet.
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- Slightly lift the cover at the top of the instrument after unscrewing the two countersunk screws on the left, slightly shift to the right and lift off.
- Place the instrument onto the left side.
- Disconnect the two ribbon cables of the REARPANEL BOARD2 from MOTHERBOARD1.
- Unscrew the 6 combi screws of the rear-panel cover and disconnect all coax cables of the BNC connectors at the respective modules. Disconnect any option connectors mounted on the integrated rear panel. Pull the rear panel towards the rear.
- Loosen all interface screws to the REARPANEL BOARD2 on the integrated rear panel and take out REARPANEL BOARD2.

Installing the new REARPANEL BOARD2 and completing the instrument

- Install new REARPANEL BOARD2, fasten with screws and connect all connectors in the reverse order.
- Complete the instrument without causing damage to the cables.
- Connect the instrument to the mains and switch on.

Troubleshooting

Faulty functions may sometimes originate in simple causes, but sometimes they also result from faulty components.

These troubleshooting instructions permit to trace the fault down to module level and make the instrument ready for use again by means of module adjustment.

For the module adjustment and further error elimination, we recommend to send the instrument to our authorized service (see list of addresses, *preface*).

Warning!

Live modules must not be removed or plugged in!

Do not produce short-circuits when measuring voltages!

For simple troubleshooting, the CMU provides the following tools:

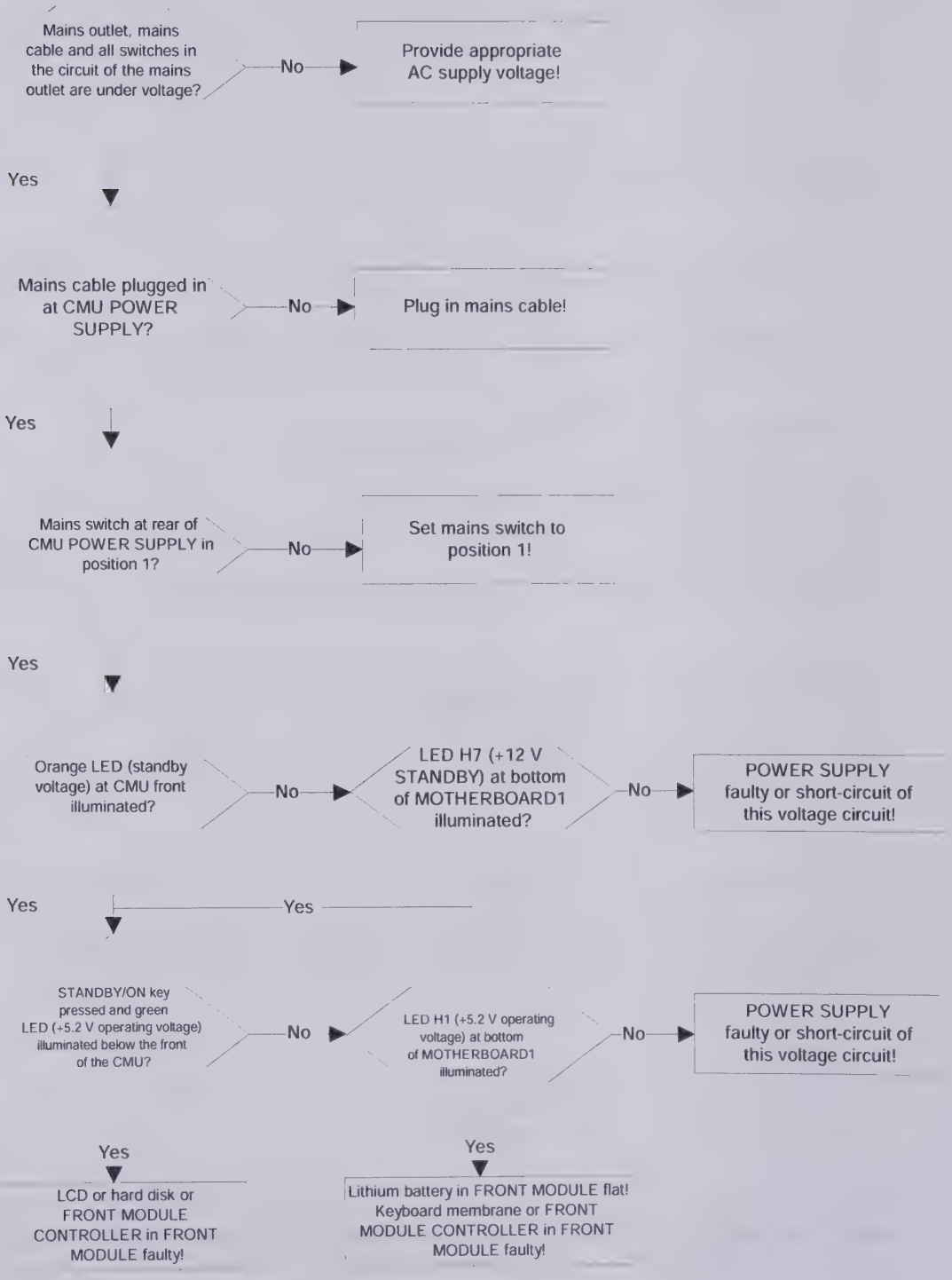
- Nine green LEDs (H1 to H8) at the bottom of MOTHERBOARD1, which indicate the operating voltages.
- A SELFTEST and INFO menu, which presents voltages via the module-internal diagnosis and RF loop-measurements with internal RF generator and RF analyzer.
- ERROR messages on the LCD display with references to sources of error.

Note: *In the case of problems first check all connections for damage (cables, plug-and-socket connections etc.) or wrong positions.*

For advanced troubleshooting on board-level, see Service Manual Modules (1100.4903.94-01).

Troubleshooting using the LEDs (H1 to H8) on the MOTHERBOARD

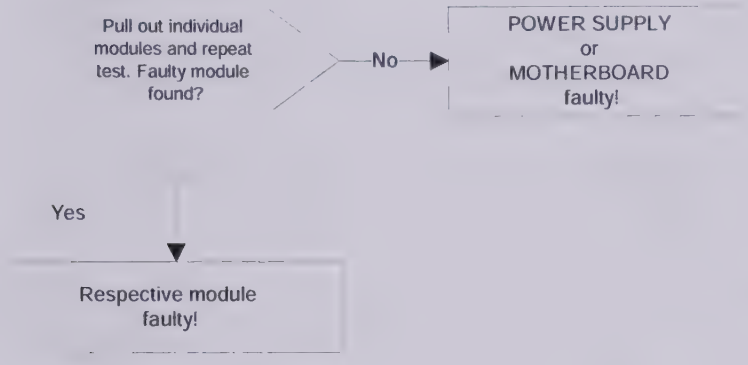
- **Fault: CMU cannot be switched on.**


Mains outlet, mains cable and all switches in the circuit of the mains outlet are under voltage?
No
Provide appropriate AC supply voltage!
Yes
Mains cable plugged in at CMU POWER SUPPLY?
No
Plug in mains cable!
Yes
Mains switch at rear of CMU POWER SUPPLY in position 1?
No
Set mains switch to position 1!
Yes
Orange LED (standby voltage) at CMU front illuminated?
No
LED H7 (+12 V STANDBY) at bottom of MOTHERBOARD1 illuminated?
No
POWER SUPPLY faulty or short-circuit of this voltage circuit!
Yes
Yes
STANDBY/ON key pressed and green LED (+5.2 V operating voltage) illuminated below the front of the CMU?
No
LED H1 (+5.2 V operating voltage) at bottom of MOTHERBOARD1 illuminated?
No
POWER SUPPLY faulty or short-circuit of this voltage circuit!
Yes
LCD or hard disk or FRONT MODULE CONTROLLER in FRONT MODULE faulty!
Yes
Lithium battery in FRONT MODULE flat! Keyboard membrane or FRONT MODULE CONTROLLER in FRONT MODULE faulty!

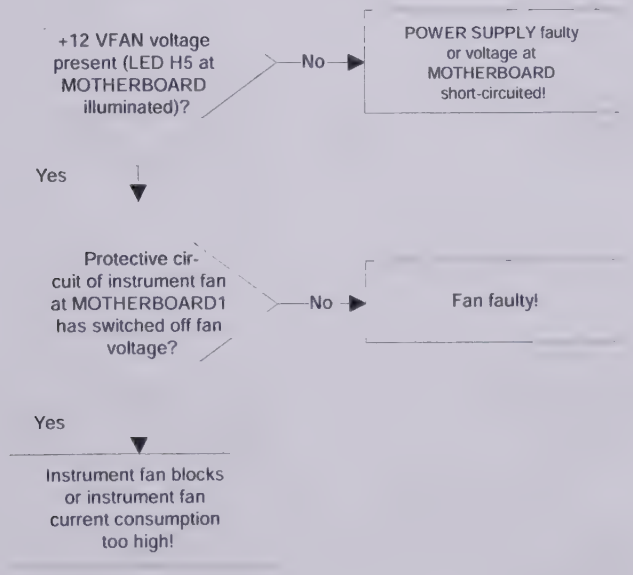
- **Fault: Short-circuit of one or several operating voltages**

➢ Check LEDs (H1 to H8) at the bottom of MOTHERBOARD1 to determine which voltage is short-circuited.

Note: *In the case of a short-circuit, the power supply switches off all voltages after a short period of time.*
Restart is possible using the ON/STANDBY key.


Pull out individual modules and repeat test. Faulty module found?
No
POWER SUPPLY or MOTHERBOARD faulty!
Yes
Respective module faulty!

- **Fault: Instrument fan does not work.**


+12 VFAN voltage present (LED H5 at MOTHERBOARD illuminated)?
No
POWER SUPPLY faulty or voltage at MOTHERBOARD short-circuited!
Yes
Protective circuit of instrument fan at MOTHERBOARD1 has switched off fan voltage?
No
Fan faulty!
Yes
Instrument fan blocks or instrument fan current consumption too high!

Note: *Measure instrument fan voltage at connector X 211! By pressing the STANDBY/ON key again, the protective circuit of the instrument fan can be restarted.*

Troubleshooting using the SELFTEST Menu for Modules

The SELFTEST menu indicate the diagnostic voltages for the individual modules of which the modules settings are exactly defined. Thus, a specific selftest of the respective module is possible.
This menu additionally features internal RF power measurements which are designed as RF loop with internal generator and analyzer. This is why a simple RF path is possible.

The selftest menu can be called up via the *MENU SELECT* key on the front panel of the CMU.
Call the selection BASE via the spinwheel in the *MENU SELECT* and confirm with ENTER.
The respective selftest can be selected via the softkey *SELECT* and the spinwheel.

The following selftests are available:

- Continuous Selftest (Continous selftest via System Selftest and Internal RF Loop Selftest, passed/failed with error output is only indicated; additionally in case of errors, it is created an error file 'cst.err'*)
- Internal RF Loop Selftest (Selftest RF path by power measurements via internal generator and analyzer, in this case all measured values are indicated.)
- System Selftest (Selftest instrument for diagnostic voltages, passed/failed with error output is only indicated.)
- FE Selftest (Selftest Module RF FRONTEND for diagnostic voltages, in this case all measured values are indicated.)
- REF Selftest (Selftest Module REFERENCE BOARD for diagnostic voltages, in this case all measured values are indicated.)
- DIG Selftest (Selftest Module DIGITAL BOARD for diagnostic voltages, in this case all measured values are indicated.)
- RXTX1 Selftest (Selftest Module RXTX1 BOARD for diagnostic voltages, in this case all measured values are indicated.)
- 1→4/3→2 RF Loop Selftest RF Path RF1→RF4IN and RF3OUT→RF2 via external N-coax cable by power measurements via internal generator and analyser, in this case all measured values are indicated.

After having selected and confirming with the ENTER key, the test can be started by selecting the TEST softkey and the ON key.
Pressing the REPORT softkey and turning the spinwheel the indicated page can be pulled up and down.
If errors (red color) are produced by this test, the error will be found out and elimated on the respective module.

---

* ***Note:*** *You can read the error file 'cst.err' as follows:*
Connect the external keyboard connector to the rear panel of the CMU.
Switch on the CMU and wait until the CMU is booted.
- *Start the Continuous Selftest (only when errors have occurred, the file 'cst.err' is created. Don't finish the Continuous Selftest with OFF, otherwise the 'cst.err' file will be deleted.)*
- *Press the keys ALT and F4 of the external keyboard to get to the DOS mode.*
- *Read the file with the DOS editor: 'edit cst.err'*
- *Quit the DOS editor and start CMU operating software with: 'cmu.bat'.*

Troubleshooting using the INFO Menu for Modules

The INFO menu can be called up via the *INFO* key on the front panel of the CMU from each measurement application of the CMU. Thus, it is possible to get diagnostic voltages, when the measurement application on the respective module is exactly selected, e.g. to determine whether a PLL has locked in.
The respective module state can be selected via the softkey *SELECT* and the spinwheel.

The following info menus are available:

- FE State (State test MODULE RF FRONTEND for diagnostic voltages, in this case all measured values are indicated.)
- REF State (State test MODULE REFERENCE BOARD for diagnostic voltages, in this case all measured values are indicated.)
- DIG State (State test MODULE DIGITAL BOARD for diagnostic voltages, in this case all measured values are indicated.)
- RXTX1 State (State test RXTX1 BOARD for diagnostic voltages, in this case all measured values are indicated.)

After having selected and confirming with the *ENTER* key, the test can be started by selecting the *TEST* softkey and the *ON* key.
Pressing the *REPORT* softkey and turning the spinwheel the indicated page can be pulled up and down.

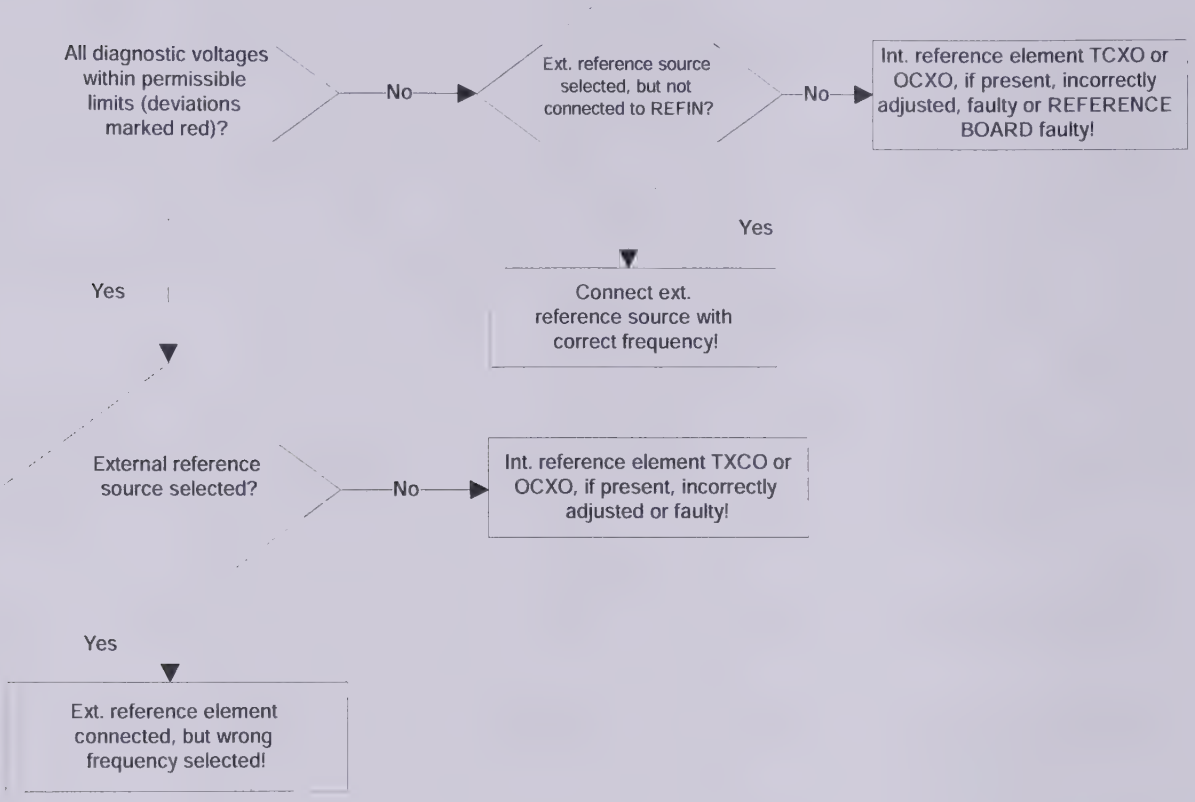
Note: Diagnostic voltages which are called up by the INFO key, are partly depending on the active measurement application. Which is why some voltages may be out of tolerance (red color), when this function is not used by the selected application.

**If the fault is not clear, it is useful to call up the SELFTEST Menu and check all diagnostic voltages of the modules to determine whether there are discernible deviations.
This knowledge then enables a specific module replacement in order to eliminate the error.**

- **Example: Info menu REFERENCE BOARD**

Fault: The frequency accuracy of the RF signal deviates.

Call the Maintenance Menu via the *INFO* Key select REFERENCE BOARD, start the diagnosis measurement using the *TEST* Key and activate the *ON* hardkey.


All diagnostic voltages within permissible limits (deviations marked red)?
No
Ext. reference source selected, but not connected to REFIN?
No
Int. reference element TCXO or OCXO, if present, incorrectly adjusted, faulty or REFERENCE BOARD faulty!
Yes
Connect ext. reference source with correct frequency!
Yes
External reference source selected?
No
Int. reference element TXCO or OCXO, if present, incorrectly adjusted or faulty!
Yes
Ext. reference element connected, but wrong frequency selected!

Troubleshooting using the ERROR messages on the LC display

Error message	Error description	Troubleshooting to
These clocks are not present: NET_CLOCK_1 NET_CLOCK_2	Netclock 1 / 2 not present	REFERENCE BOARD, DIGITAL BOARD, MMCX cable W31/W32
These clocks are not present: FIXED_CLOCK	110.8MHz Reference clock not present	REFERENCE BOARD, DIGITAL BOARD, MMCX cable W33
DIG diag adc cal error	Calibration error of the diagnosis AC/DC converter	DIGITAL BOARD
FE pow adc cal error	Calibration error of the power meter AC/DC converter	RF FRONTEND
FE eprom data error FE pow meter data error	General eprom data error Eprom power meter data error	RF FRONTEND RF FRONTEND
timeout in 331 handshake	Communication error correction processor	TR-CORRECTION MODULE on RXTX BOARD

More troubleshooting

General errors on the transmitter side of the CMU

Error description	Troubleshooting to
Setting frequency in the module test faulty	REFERENCE BOARD MMCX cable W12 RXTX BOARD1 TR-CORRECTION MODULE1 MMCX cable W17 AUC MODULE1 TX DSP MODULE1
Setting frequency in the signalling test faulty	UNIV. SIGN. UNIT DIGITAL BOARD
Setting level in the module test faulty	RF FRONTEND SMA-cable W13 RXTX BOARD1 TR-CORRECTION MODULE1 MMCX cable W17 AUC MODULE1 TX DSP MODULE1
Setting level in the signalling test faulty	UNIV. SIGN. UNIT DIGITAL BOARD
Modulation in the module test faulty	DIGITAL BOARD AUC MODULE1 TX DSP MODULE1
Modulation in the signalling test faulty	DIGITAL BOARD AUC MODULE 1 UNIV. SIGN. UNIT

General errors on the receiver side of the CMU

Error description	Troubleshooting to
Received frequency in the module test faulty	REFERENCE BOARD MMCX cable W12 RXTX BOARD1 TR-CORRECTION MODULE1 MMCX cable W19 ADC MODULE1 DDC MODULE1
Received frequency in the signalling test faulty	UNIV. SIGN. UNIT DIGITAL BOARD
Received level in the module test faulty	RF FRONTEND SMA-cable W14 RXTX BOARD1 TR-CORRECTION MODULE1 MMCX cable W19 ADC MODULE1 DDC MODULE1
Received level in the signalling test faulty	RF FRONTEND SMA-cable W14 RXTX BOARD1 TR-CORRECTION MODULE1 MMCX cable W19 ADC MODULE1 DDC MODULE1 UNIV.SIGN. UNIT
Trigger releases no measurement RF POWER IF POWER	 RF FRONTEND DIGITAL BOARD DDC-MODULE1 RXTX BOARD1 DIGITAL BOARD DDC-MODULE1

4 Software Update/Installing Options

This chapter contains information on extension and modification of the CMU. Additional manuals obtained together with a software/firmware update or with subsequently acquired options can be filed here.

New Installation of the CMU Software

A software update can be performed in the CMU using the PCMCIA INTERFACE or the FLOPPY DISK DRIVE (CMU-U61).

One of these is always installed in the CMU (compulsory option).

The software update is carried out in the CMU using the **VersionManager**. This tool enables convenient installation, deletion and activation of different software versions. It also permits to perform a firmware update of modules following module replacement (see chapter 2, *Automatic Adjustment*).

The CMU is always supplied with the latest software version including the version manager.

Note: *The newest CMU software is also available at the R&S Lotus Notes Service Board.*

Software Update via PCMCIA INTERFACE

For the PCMCIA INTERFACE, two drive slots are provided. Both drive slots can be used for the software update. An installation medium is automatically searched for. The flash disks type and the hard disk (type 3) feature a small groove on one side; the disks are to be inserted into the drive slot with the groove pointing upwards.

Note: *The drive designation is as follows: right drive slot (slot 0) is drive D: left drive slot (slot 1) is drive E:. Hard disk can only be inserted into the right drive slot (Slot 0; drive D:).*

To perform the software update, the instrument must be switched off, then the software update flash disk or hard disk must be inserted into the PCMCIA INTERFACE on the instrument and the instrument switch on.
Then the further update flash disks (if necessary) must be inserted one after the other. Please follow the hints in the **VersionManager**.

Software Update via FLOPPY DISK DRIVE

To perform the software update, the instrument must be switched off, then the first software update floppy ('3.5') must be inserted into the FLOPPY DISK DRIVE of the instrument and the instrument switched on.
Then the further update floppies must be inserted one after the other. Please follow the hints in the **VersionManager**.

Performing a Software Update

On start-up, an automatic test is made to check whether an update floppy disk or a flash disk/hard disk is available. If this is the case, the version manager is started, displaying the following possible selections:

VersionManager Ver X.X

The active CMU software is the version: [active version]

◄— activate other software version

◄— delete a software version

◄— install software version from FLOPPY DISK DRIVE or PCMCIA Slot X

◄— firmware update after board change

◄— edit service tables

◄— exit

In the above menu, an action can be selected using the softkey located to the left of the arrow.

- For the software update select the action *install new software version* from the Floppy DISK DRIVE or the PCMCIA Slot X.
- Press the softkey to the left of the above mentioned menu item. An overview of the software versions that already provided on the installation media will appear.
- Select the desired version by pressing the softkey to the left of the arrow.

  The software update will then start automatically, prompting the user to insert a further update floppy disk or flash disk, if necessary. Confirm using the ENTER hardkey.

Note: *In the case of several update floppy disks or flash disks always observe the order of the disk numbers.*

- When all update floppy disks or flash disks have been loaded, follow the prompt

  Remove installation media and press ENTER key

The CMU boots again and automatically performs a firmware update of the hardware boards. This may take a few minutes. Then the new software version will start and the CMU is ready for use.

Reinstalling the Old Software

As described above, each software version, even older versions, can be simply loaded from a appropriate floppy disk or flash disk/hard disk using the version manager. It is also possible to keep several software versions stored on the hard disk in the CMU and reload them, if required, using the version manager. To this end, proceed as follows:

- During start-up observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The version manager is now started (see also chapter 4, *Software Update*). The display includes the menu item *activate other software version.*
- Press the softkey to the left of the above mentioned menu item.

  An overview of the software versions that are already provided in the CMU will appear.
- Select the desired version by pressing the softkey to the left of the arrow.

The selected software version is loaded. After the firmware update of the hardware boards has been terminated, the operating software starts automatically and the CMU is ready for use and can be operated as usual.

Loading Software as long as there is no Version Manager in the CMU

In case of unintentional deletion of the version manager, new loading of the version manager is necessary.

For this purpose, a software update floppy disk or flash disk type 2 / hard disk (type 3) and an external keyboard to be plugged in at the rear panel of the CMU at the KEYBOARD connector are required.

- Insert software update floppy disk No. 1 or flash disk / hard disk into the respective drive, switch on the CMU and use the external keyboard to select drive a: (with floppy disk drive) or d:/e: (with flash disk/hard disk) when the DOS prompt appears.

Note: *Using the hardkey combination 'Alt' and 'F4' on the external keyboard you get from the operating software into the DOS mode.*

- Change to the subdirectory of the update floppy or flash disk/hard disk (cd\...).
- Enter the command install.bat a:/d:/e: (corresponding to the respective drive) via the external keyboard.
- Confirm using the ENTER hardkey.

The version manager will be loaded and a software update can then be performed as described above.

Installing the Options

The following options are available with the CMU:

Option OCXO REFERENCE OSC. $2*10^{-7}$ Aging/year	CMU-B11	1110.5000.02
Option OCXO REFERENCE OSC. $3.5*10^{-8}$ Aging/year	CMU-B12	1110.5100.02
Option ADDITIONAL RF/IF CONNECTORS	CMU-B15	1110.6006.02
Option UNIVERSAL SIGNALLING UNIT	CMU-B21	1100.5200.02
Option AUDIO-GEN. + ANA.	CMU-B41	1100.5300.02
Option SPEECH CODEC for CMU-B21	CMU-B52	1110.5400.02
Option FLOPPY DISK DRIVE	CMU-U61	1110.5500.02
SW Package GSM 900 for CMU-B21	CMU-K21	1115.6007.02
SW Package GSM 1800 for CMU-B21	CMU-K22	1115.6107.02
SW Package GSM 1900 for CMU-B21	CMU-K23	1115.6207.02

Depending on the model ordered, the CMU comes with options partly installed in the factory. For retrofitting, please note the mounting instructions enclosed with the options.
These mounting instructions can be filed at this place in the service manual and are thus easily available whenever they are required.

Caution!

The following accessories for the rackmount are available:

- *19" adapter ZZA-411 (standard installation kit with bracket), Stock No. 1096.3283.00*

All options can be installed by the user himself. No additional measuring equipment is necessary for putting into operation.

Caution!

Disconnect the instrument from the mains before opening the casing. Also note the safety instructions at the beginning of this manual.

The components used in the instrument are sensitive to electrostatic discharges which is why they are to be dealt with according to the ESD regulations.

When installing hardware options note the following:

- Switch off instrument and pull the mains plug.
- Unscrew rear panel feet of the rear side (four Phillips screws, size 2).
- Place the instrument onto the front carrying handles, push the tube upwards and take off.
- After installing the option replace the tube and fasten the rear panel feet again.

Caution!

When replacing the tube take care not to damage or pull off cables.

- Switch on CMU. Install additional software, if supplied, according to the instructions (see section "New Installation of the CMU Software") or enable the additional software functions (see *Installation instructions for the respective option).* The software will then automatically detect the installed option (option display can be called using the *SETUP* key and the item *Options*!). If an adjustment is required for this option, the appropriate hints are to be found in the installation instructions for the option.

Option OCXO REFERENCE OSC. CMU-B11 1110.5000.02

To this end the instrument must be opened. Proceed according to the instructions enclosed with the option (see also chapter 3, *Replacing the OPTION OCXO REFERENCE OSC. CMU-B11 1100.5000.02*).

Option OCXO REFERENCE OSC. CMU-B12 1110.5100.02

To this end the instrument must be opened. Proceed according to the instructions enclosed with the option (see also chapter 3, *Replacing the OPTION OCXO REFERENCE OSC. CMU-B12 1100.5100.02*).

Option ADDITIONAL RF/IF CONNECTORS CMU-B15 1100.6006.02

To this end the instrument must be opened. Proceed according to the instructions enclosed with the option (see also chapter 3, *Replacing the OPTION ADDITIONAL RF/IF CONNECTORS CMU-B15 1100.6006.02*).

Option UNIV. SIGN. UNIT CMU-B21 1100.5200.02

To this end the instrument must be opened. Proceed according to the instructions enclosed with the option (see also chapter 3, *Replacing the OPTION UNIV. SIGN. UNIT CMU-B21 1100.5200.02*).

Option AUDIO-GEN. + ANA. CMU-B41 1100.5300.02

To this end the instrument must be opened. Proceed according to the instructions enclosed with the option (see also chapter 3, *Replacing the OPTION AUDIO-GEN. + ANA. CMU-B41 1100.5300.02*).

Option SPEECH CODEC for CMU-B21 CMU-B52 1110.5400.02

To this end the instrument must be opened. Proceed according to the instructions enclosed with the option (see also chapter 3, *Replacing the OPTION SPEECH CODEC CMU-B52 1100.5400.02*).

Option FLOPPY DISK DRIVE CMU-U61 1110.5500.02

To this end the instrument must be opened. Proceed according to the instructions enclosed with the option (see also chapter 3, *Replacing the OPTION FLOPPY DISK DRIVE CMU-U61 1110.5500.02*).

SW Package GSM 900 for CMU-B21 CMU-K21 1100.6007.02

This software option does not require opening of the instrument. Proceed according to the instructions enclosed with the option.

SW Package GSM 1800 for CMU-B21 CMU-K22 1115.6107.02

This software option does not require opening of the instrument. Proceed according to the instructions enclosed with the option.

SW Package GSM 1900 for CMU-B21 CMU-K23 1115.6207.02

This software option does not require opening of the instrument. Proceed according to the instructions enclosed with the option.

Installation of Option CMU-B11 OCXO REF.OSC. (1100.5000.02)

Contents

1 Preparation **2**

2 Installation of Option **3**

3 Assembling Unit **4**

4 Functional Test of Option CMU-B11 ..... **5**

This option may also be installed at the customer's

1 Preparation

1.1 Switch off unit and unplug power cable

1.2 Screw off cabinet feet (four cross-recessed screws, size 2).

1.3 Place unit on handles at the front, push casing upwards and remove (Fig. 1)

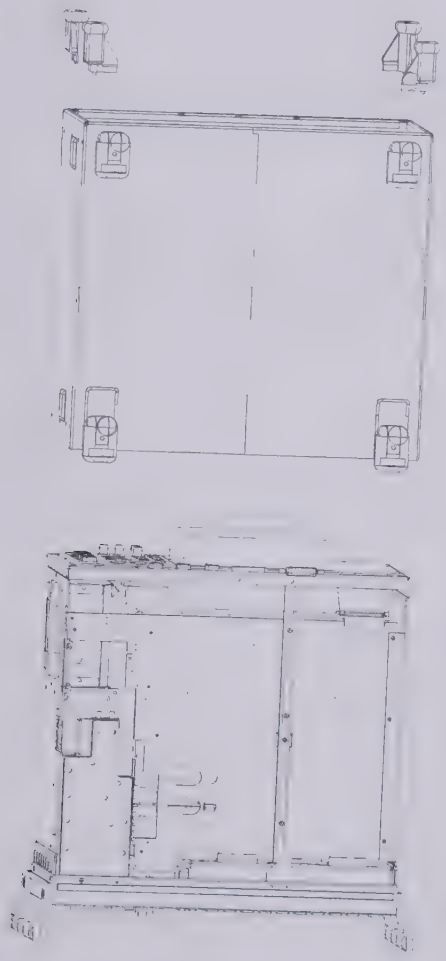


Fig. 1

2 Installation of Option

2.1 Insert OCXO REFERENCE OSC. into unit from the side until it plugs into connector X212 on motherboard 1

2.2 Fit OCXO REFERENCE OSC. using the three supplied screw and washer assemblies (VS 0071.5040.00, see Fig. 2)

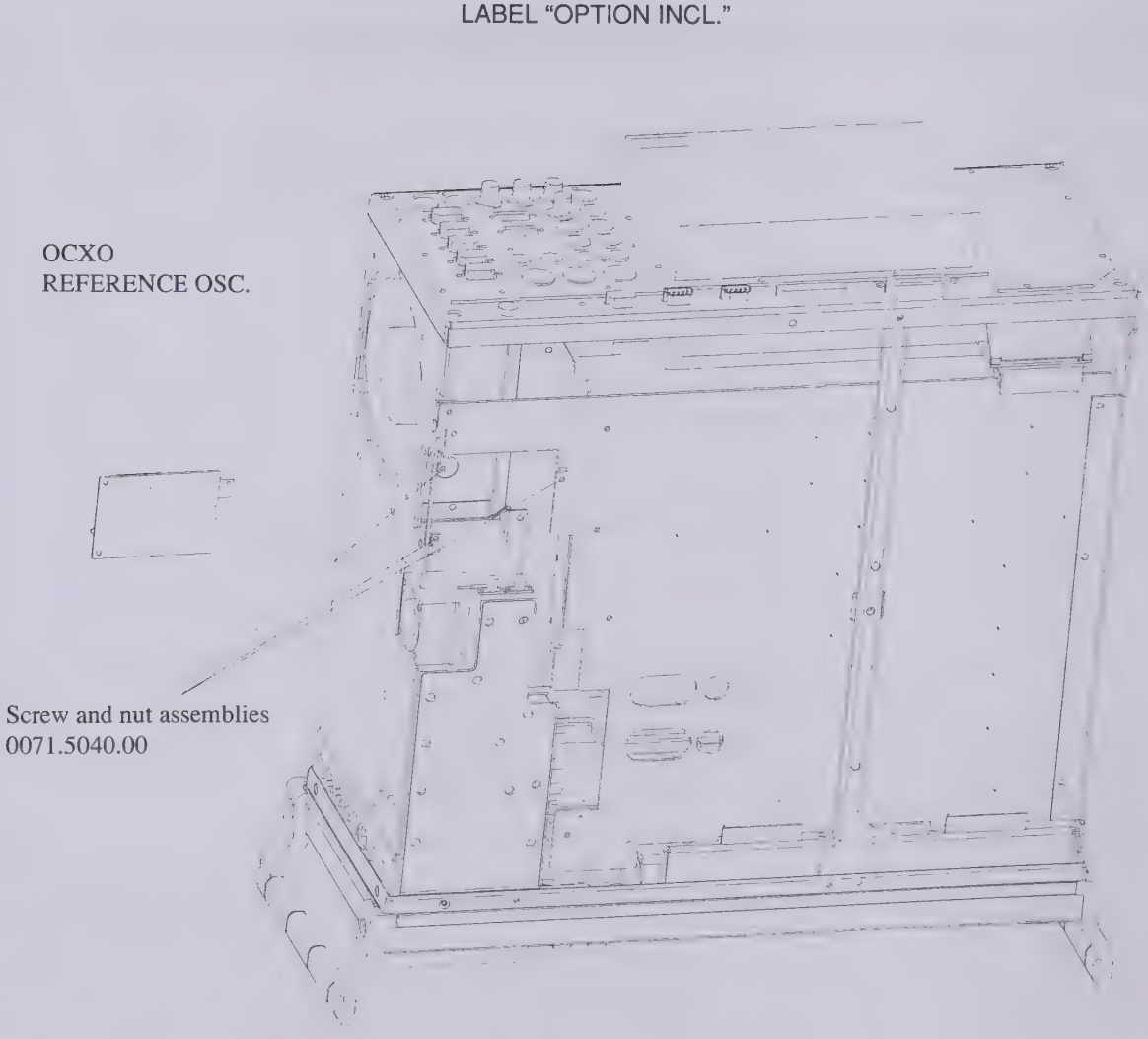


Fig. 2

3 Assembling Unit

3.1 Affixing Option Label

Affix OPTION INCL. label to power supply unit (Fig. 2)

3.2 Putting Casing Back

Fit casing and cabinet feet in the reverse order given under 1.2 / 1.3 (Fig. 1)

4 Functional Test of Option CMU-B11

4.1 Connecting Unit to AC Supply and Switching on

4.2 Test of Option Detect

Press SETUP hardkey SYSTEM panel
Press OPTIONS softkey located on the row of keys at bottom of display

--> Check whether option CMU-B11 is indicated and activated

4.3 Test of Frequency Accuracy

Preparation: The measurement can be carried out the connector REFOUT1 (rear of CMU) at 10 MHz or at the connector RF3OUT (front panel) at 1GHz with a frequency counter

- Set the generator to 1 GHz and 13 dBm with no modulation for measurement at connector RF3OUT in the RF menu.
  For this setting, CMU must be switched to its internal reference source.
- This is to be selected in the sync menu depending on the application.

Note: *For fast setting, the measurement at 1GHz can be made with reduced resolution (1Hz)*

Measurement: (Carry out the following adjustment only if required)

- Adjust reading on frequency counter to
  10.000 000 00 MHz –0.1/+0.05 Hz (at REFOUT1) or
  1.000 000 000 GHz -10 Hz/+5 Hz (at RF3OUT)
  with the aid of potentiometer R5 on module OCXO REFERENCE OSC. (a tolerance of -2 to -5 Hz is required due to aging)

Note: *CMU must be on for at least 5 minutes for the OCXO to warm up*

Installation of Option CMU-B12 OCXO REF.OSC. (1100.5100.02)

Contents

1 Preparation **2**

2 Installation of Option **3**

3 Assembling Unit **4**

4 Functional Test of Option CMU-B11 ..... **5**

This option may also be installed at the customer's

1 Preparation

1.1 Switch off unit and unplug power cable

1.2 Screw off cabinet feet (four cross-recessed screws, size 2).

1.3 Place unit on handles at the front, push casing upwards and remove (Fig. 1)

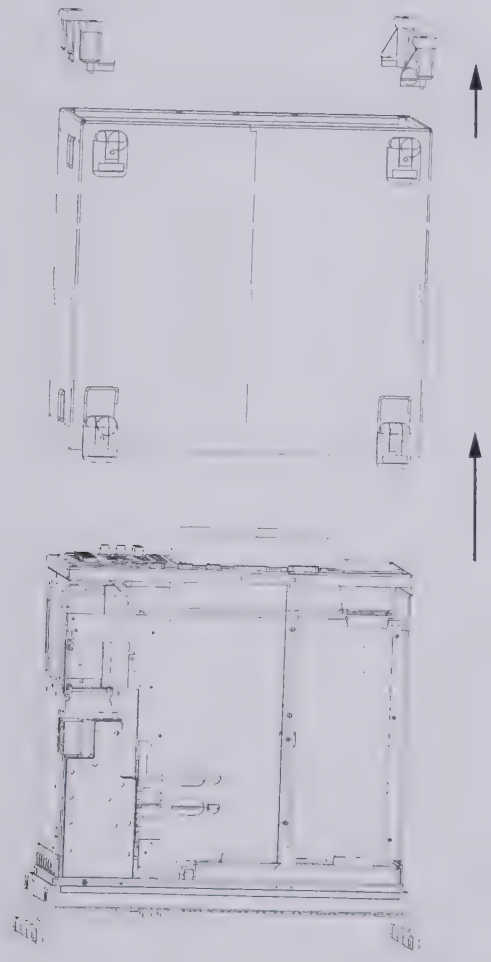


Fig. 1

2 Installation of Option

2.1 Insert OCXO REFERENCE OSC. into unit from the side until it plugs into connector X212 on motherboard 1

2.2 Fit OCXO REFERENCE OSC. using the three supplied screw and washer assemblies (VS 0071.5040.00, see Fig. 2)

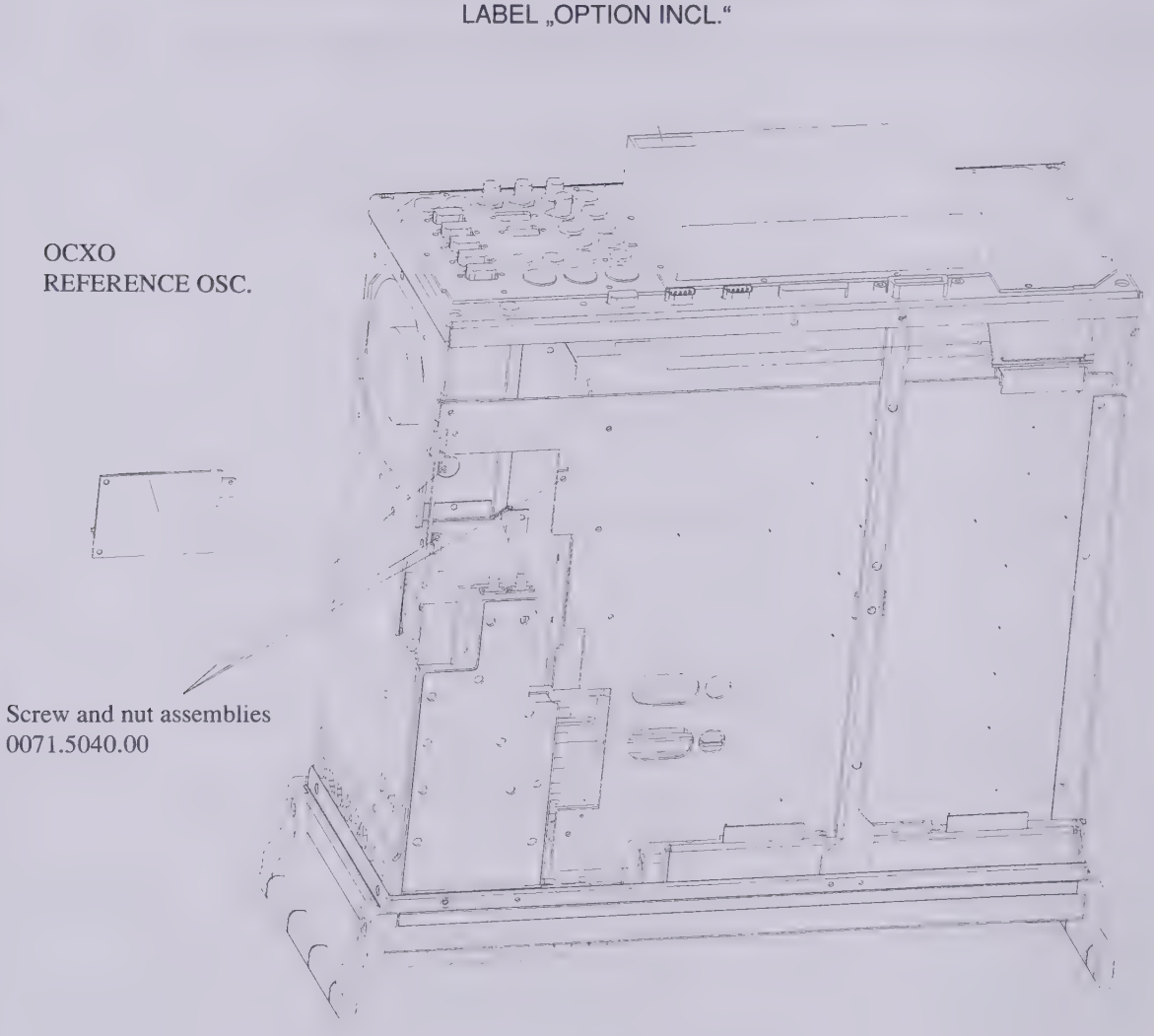


Fig. 2

3 Assembling Unit

3.1 Affixing Option Label

Affix OPTION INCL. label to power supply unit
(Fig. 2)

3.2 Putting Casing Back

Fit casing and cabinet feet in the reverse order given under 1.2 / 1.3
(Fig. 1)

4 Functional Test of Option CMU-B12

4.1 Connecting Unit to AC Supply and Switching on

4.2 Test of Option Detect

Press SETUP hardkey SYSTEM panel
Press OPTIONS softkey located on the row of keys at bottom of display

--> Check whether option CMU-B12 is indicated and activated

4.3 Test of Frequency Accuracy

Preparation: The measurement can be carried out the connector REFOUT1 (rear of CMU) at 10 MHz or at the connector RF3OUT (front panel) at 1GHz with a frequency counter

- Set the generator to 1 GHz and 13 dBm with no modulation for measurement at connector RF3OUT in the RF menu.
  For this setting, CMU must be switched to its internal reference source.
- This is to be selected in the sync menu depending on the application.

Note: *For fast setting, the measurement at 1GHz can be made with reduced resolution (1Hz)*

Measurement: (Carry out the following adjustment only if required)

- Adjust reading on frequency counter to
  10.000 000 00 MHz –0.1/+0.05 Hz (at REFOUT1) or
  1.000 000 000 GHz -10 Hz/+5 Hz (at RF3OUT)
  with the aid of potentiometer R5 on module OCXO REFERENCE OSC. (a tolerance of -2 to -5 Hz is required due to aging)

Note: *CMU must be on for at least 10 minutes for the OCXO to warm up*
During the adjustment the CMU must be operated in a horizontal position

Installation of Option CMU-B21 UNIV. SIGN. UNIT (1100.5200.02)

Contents

1 Preparation **2**

2 Installation of Option **4**

3 Assembling Unit **5**

4 Functional Test of Option CMU-B21 ..... **6**

This option may also be installed at the customer's.

1 Preparation

1.1 Switch off unit and unplug power cable

1.2 Screw off cabinet feet (four cross-recessed screws, size 2).

1.3 Place unit on handles at the front, push casing upwards and remove (Fig. 1)

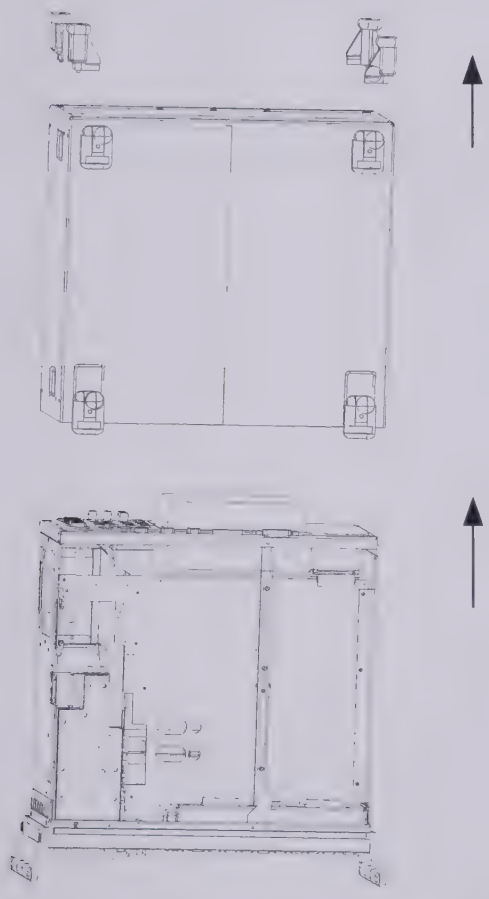


Fig. 1

1.4 After undoing two countersunk head screws at the top left frame, raise cover slightly, push somewhat to the right and take it off towards the top.

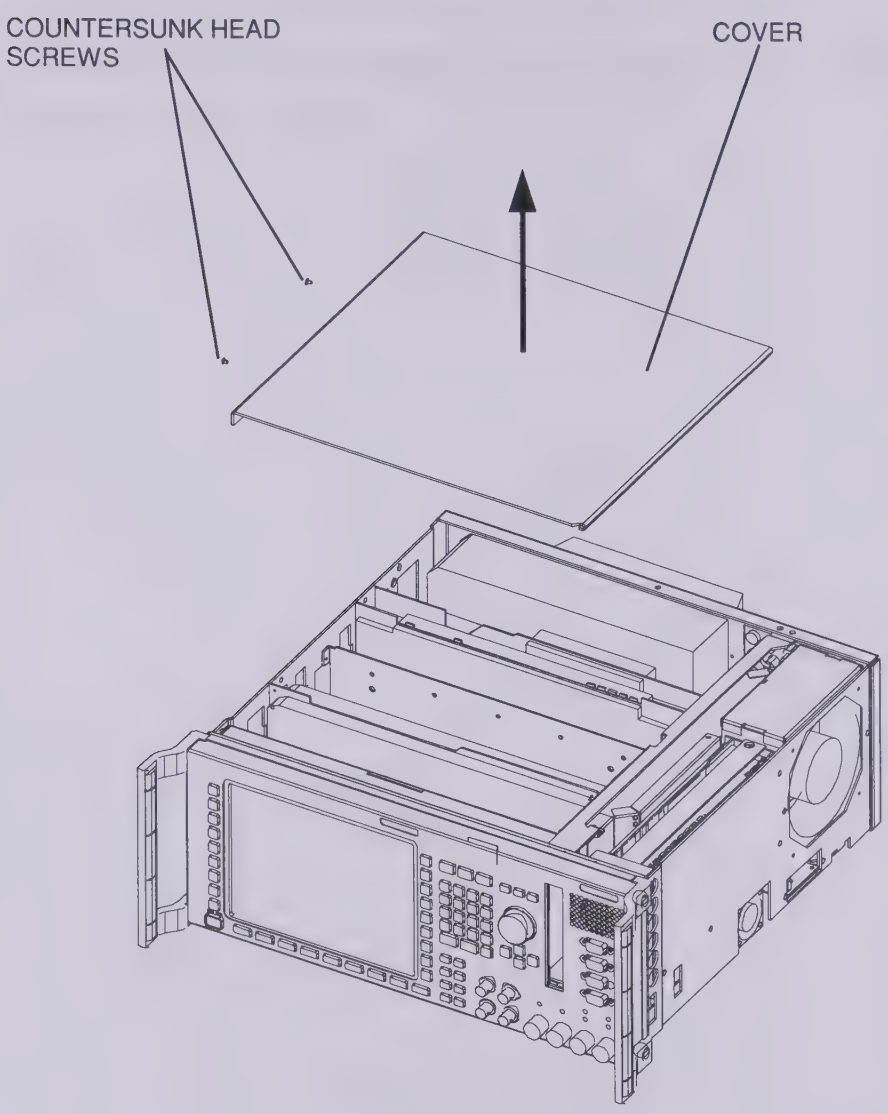


Fig. 2

2 Installation of Option

2.1 Remove cover on the vent in the intermediate panel of the 7th slot as seen from the front (Fig. 3)

2.2 Insert CMU-B21 into seventh slot as seen from the front

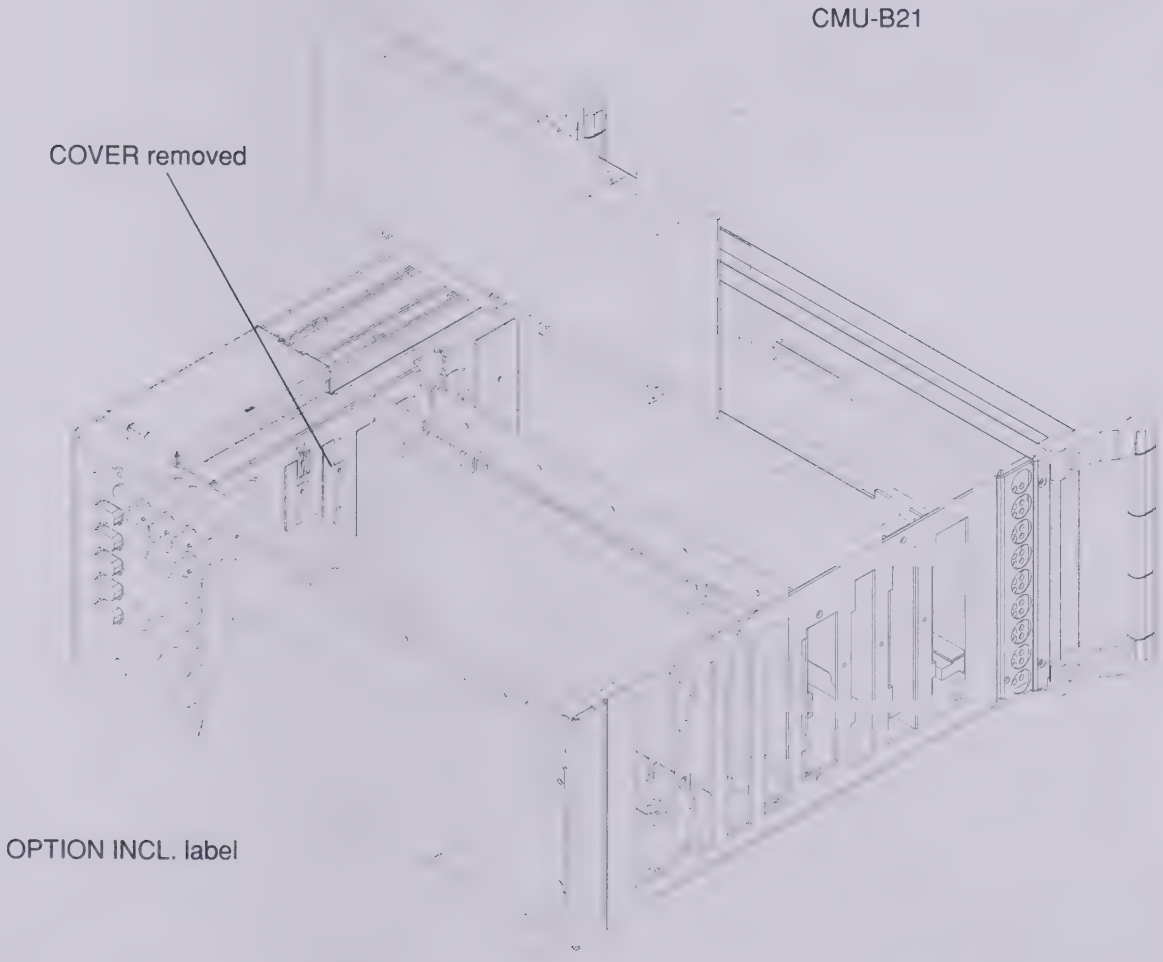


Fig. 3

3 Assembling Unit

3.1 Affixing Option Label

Affix OPTION INCL. label on power supply unit
(Fig. 2)

3.2 Putting Cover Back

Fit cover and cabinet feet back on in the reverse order to that described under 1.2/1.3
(Fig. 1)

4 Functional Test of Option CMU-B21

4.1 Connect unit to AC supply and switch on

4.2 Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The VersionManager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE.*
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well.
  This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications.

4.3 Test of Option Detect

Press SETUP hardkey in SYSTEM panel
Press OPTIONS softkey located on the row of keys at bottom of display

--> Check whether CMU-B21 is active

4.4 Test of Function

Press MENU SELCT hardkey on FUNCTION panel
Press GSM 900 softkey on the row of keys at bottom of display

--> Check whether the SIGNAL ON indication in the top right display (blue status field) is highlighted in green

Installation of Option CMU-B41 AUDIO-GEN.+ANA. (1100.5300.02)

Contents

1 Preparation 2

2 Installation of Option 4

3 Assembling Unit 5

4 Functional Test of Option CMU-B41 7

This option may also be installed at the customer's.

1 Preparation

1.1 Switch off unit and unplug power cable.

1.2 Screw off cabinet feet (four crosss-recessed screws, size 2).

1.3 Place unit on handles at the front, push casing upwards and remove (Fig. 1).

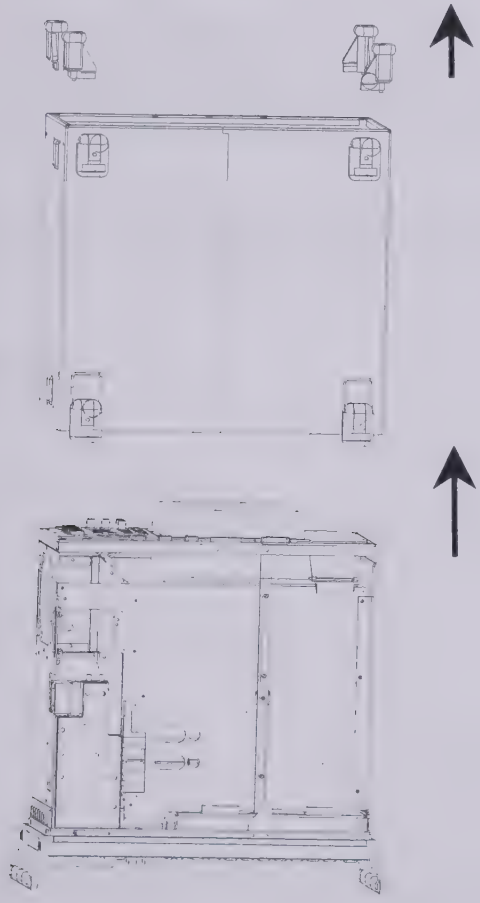


Fig.1

1.4 After undoing two countersunk head screws at the top left frame, raise cover slightly, push somewhat to the right and take it off towards the top

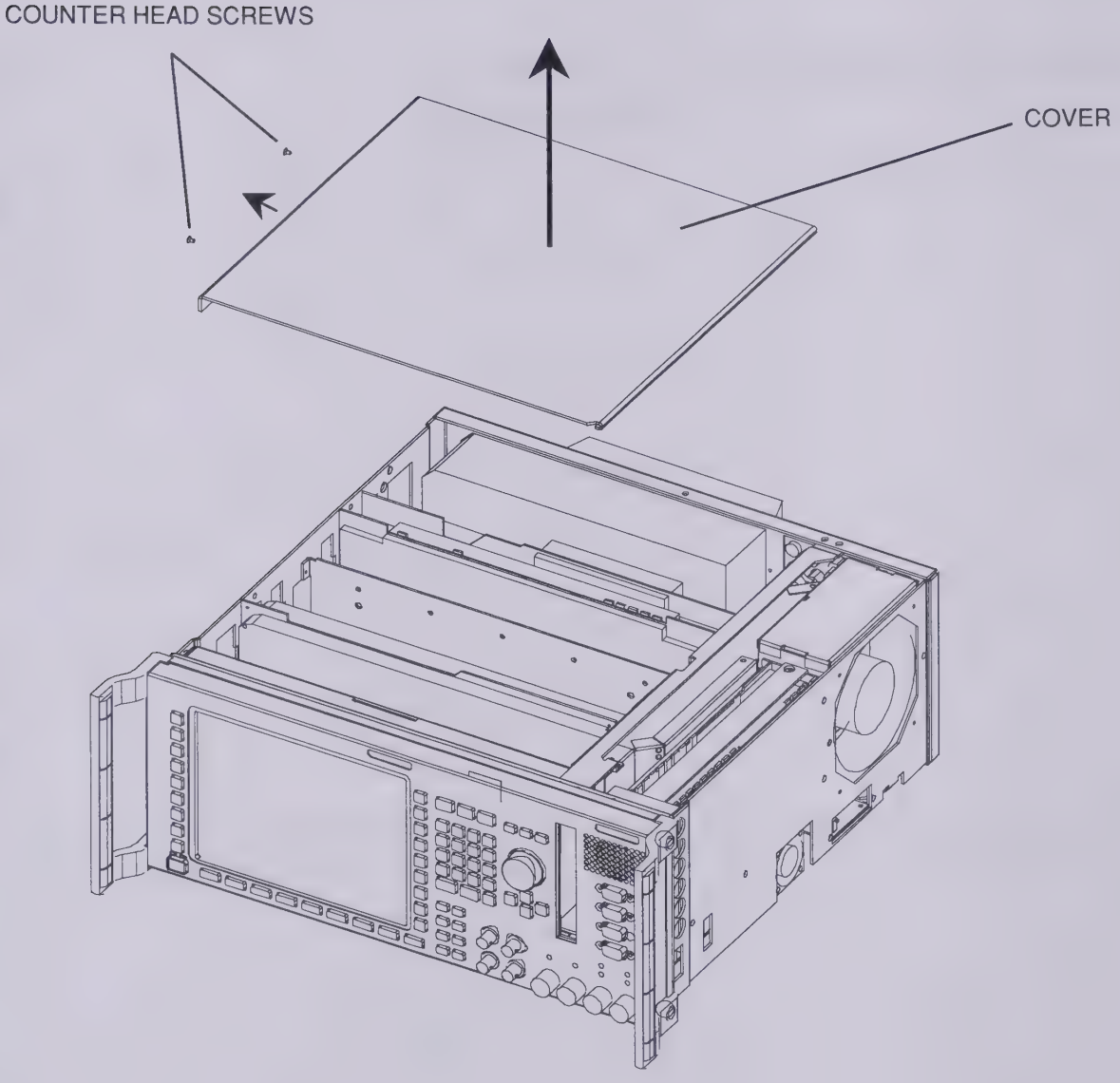


Fig. 2

2 Installation of the Option

2.1 Remove clamp. Take off vent cover between air duct and cage since it is no longer needed (Fig. 3).

2.2 Plug module CMU-B41 into free slot at the right-hand side of unit.

2.3 Mount clamp again (Fig. 3).

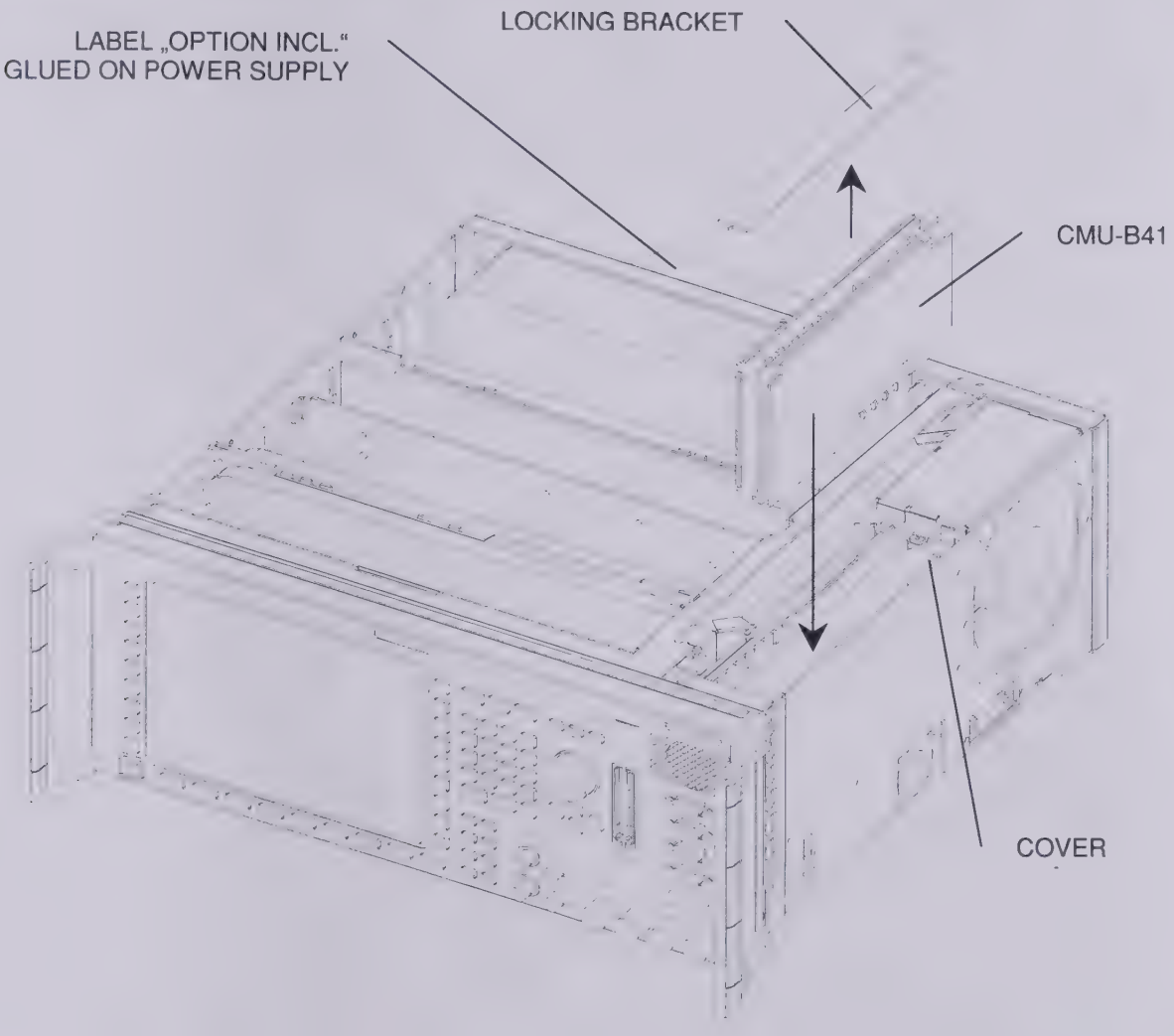


Fig. 3

2.4 Cabling

The option has the electrical designation A 11.

When installing the option CMU-B41, observe that the designations of built-in cables for batches 831593..., 829740..., 830377..., and 828942... are not complete or incorrect and so the cables have to be identified according to the following list.

Source		Incomplete cable designation	Connecting end
Loudspeaker	cable	A11-X	A11/X112 *
AF IN	cable	W 6 A11-X114	A11/X113 *
AUX 1	cable	W 8	A11/X114 *
AF OUT	cable	W 5 A11-X113	A11/X115 *
AUX 2	cable	W 7	A11/X116 *

Connect the supplied RF cable as follows:

RF cable W 40	1st end	to A11/X119 *
	2nd end	to A10/X105 *
RF cable W 34	1st end	to A11/X117 *
	2nd end	to A7/X704 *

* The connector designation X .... is inscribed on the board, the cover of the audio board and the service label.

3 Assembly of Unit

3.1 Affixing Option Label

Stick "OPTION INCL." label to the power supply (Fig.3).

3.2 Fitting Enclosure

Mount enclosure and rear feet in the reverse order to that described under points 1.2/1.3 (Fig. 1).

4 Functional Test of Option CMU-B41

4.1 Cabling Unit to AC Supply and Switching on

4.2 Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The VersionManager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE*.
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well.
  This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications.

4.3 Checking Option Detection

Press SETUP hardkey in the SYSTEM field.
Press OPTIONS softkey on the row below the display.

--> Check if CMU-B41 is displayed and active.

4.3 Checking the Function

- Connect AF OUT socket to AF IN socket on CMU with a BNC cable.
- Press MENU SELECT hardkey in the FUNCTION field. Select Audio in the function group with the rotary knob on the display and confirm with ENTER.
- Switch generator to ON in the Audio Overview menu, set 1000 mV level and 1 kHz frequency.
- Set analyzer in the Audio Overview menu to RUN. The measured voltage should be 1000 mV +-25 mV.

Installation of Option CMU-B52 SPEECH CODEC (1100.5400.02)

Contents

1 Preparation **2**

2 Installation of Option **4**

3 Assembling Unit **6**

4 Functional Test of Option CMU-B52 ..... **7**

This option may also be installed at the customer's.

To install this option, option CMU-B21 must be built in before (1100.5200.02).

1 Preparation

1.1 Switch off unit and unplug power cable

1.2 Screw off cabinet feet (four cross-recessed screws, size 2).

1.3 Place unit on handles at the front, push casing upwards and remove (Fig. 1)

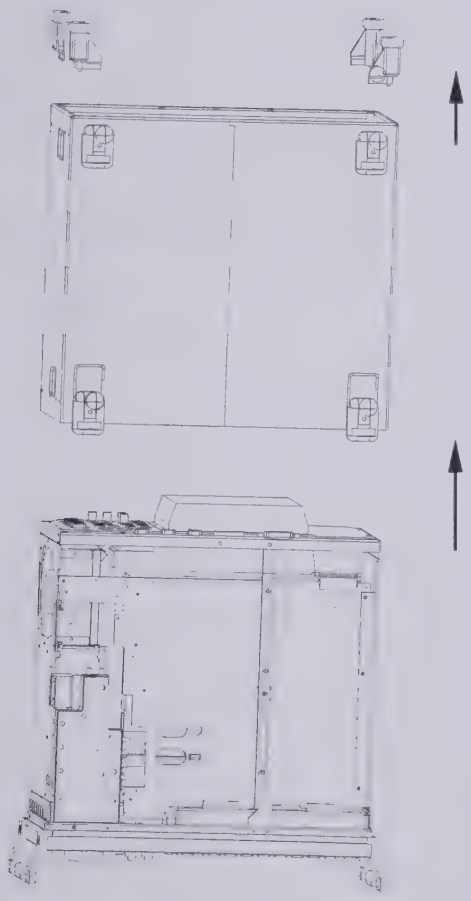


Fig. 1

1.4 After undoing two countersunk head screws at the top left frame, raise cover slightly, push somewhat to the right and take it off towards the top.

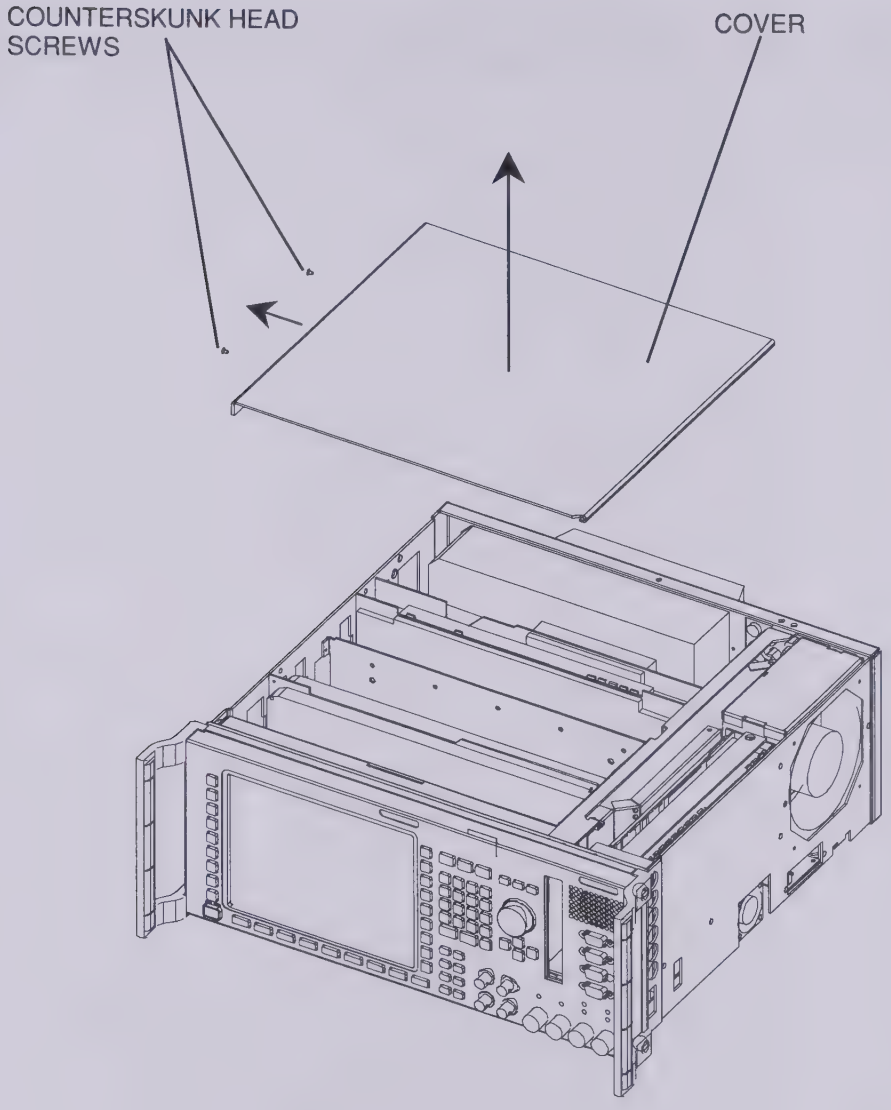


Fig. 2

2 Installation of Option

2.1 Remove module CMU-B21 from slot seven as viewed from the front and undo screws on shielding enclosure (Fig. 3)

2.2 Plug option CMU-B52 into slots on CMU-B21 A420 and A470 and affix label (Fig. 4)

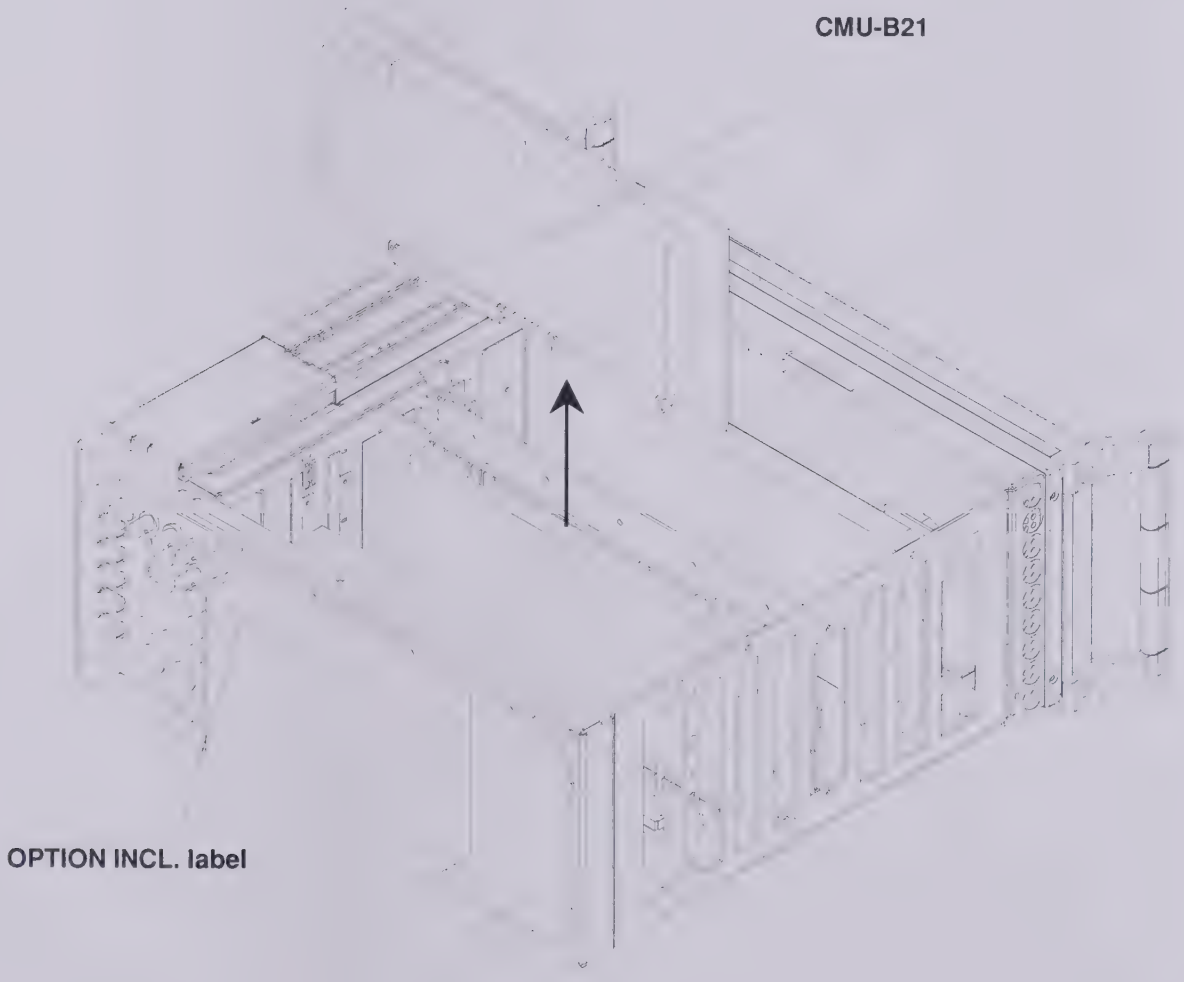


Fig. 3

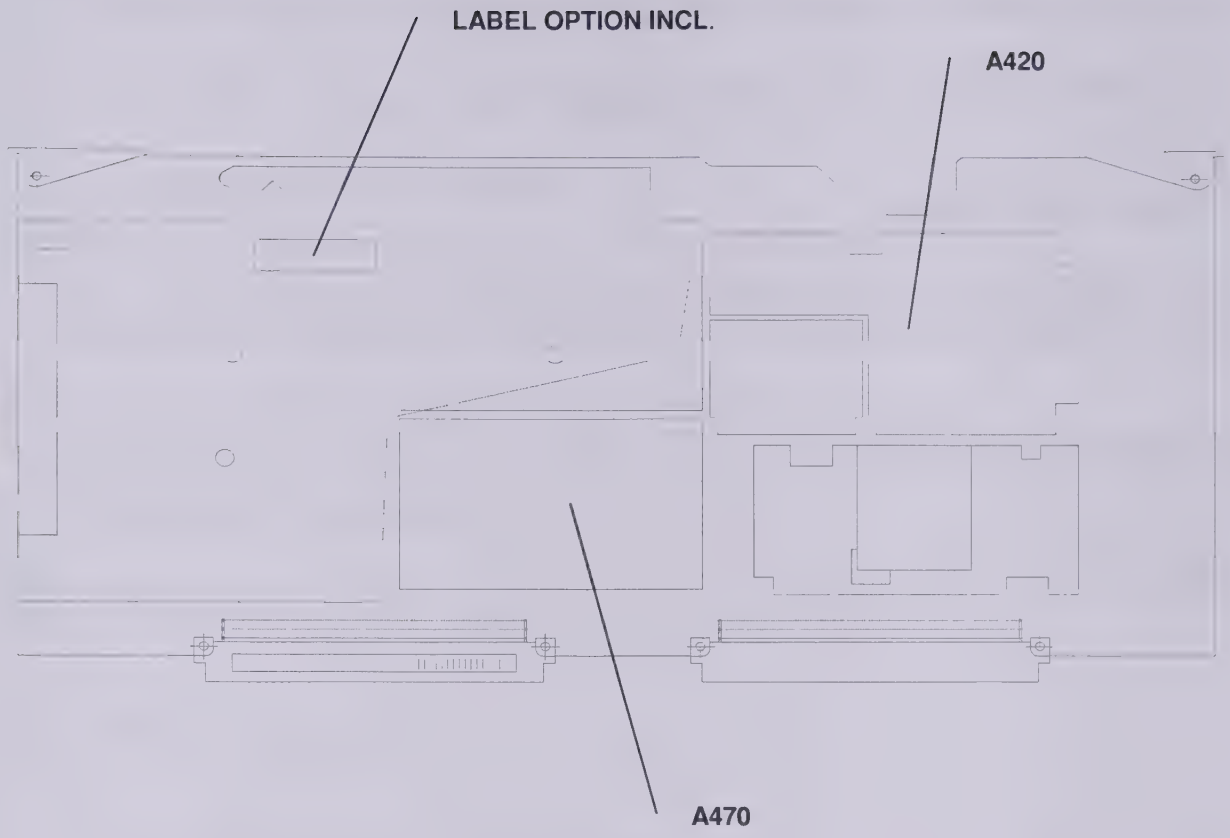


Fig. 4

3 Assembling Unit

3.1 Affixing Option Label

Affix OPTION INCL. label on power supply unit
(Fig. 3)

3.2 Assembly of Unit

Fit enclosure to module and insert module into the unit (Fig. 3).
Mount cover in the reverse order to that described under 1.4 (Fig. 2).

3.3 Putting Cover Back

Fit cover and cabinet feet back on in the reverse order to that described under 1.2/1.3 (Fig. 1).

4 Functional Test of Option CMU-B52

4.1 Connect unit to AC supply and switch on

4.2 Automatic module data adjustment

- During startup observe the display.
- When three BEEPs can be heard, press the *MENU SELECT* key.

  The VersionManager is started (see also chapter 4, *Firmware update*). The display includes the menu item *FIRMWARE UPDATE AFTER BOARD CHANGE.*
- Press the softkey to the left of the above mentioned menu item.
  The automatic module data adjustment is performed under software control, firmware updates for microprocessors and programmable devices being performed as well.
  This may take a few minutes.

After the adjustment has been terminated, the operating software starts automatically and the CMU is ready for use and complies with the specifications.

4.3 Test of Option Detect

Press SETUP hardkey in SYSTEM panel
Press OPTIONS softkey located on the row of keys at bottom of display

--> Check whether CMU-B21 is active

Installation of Option CMU-U61 FLOPPY DISKDRIVE (1100.5500.02)

Contents

1 Preparation **2**

2 Installation of Option **5**

3 Assembling Unit **8**

4 Functional Test of Option CMU-U61 ..... **9**

This option may also be installed at the customer's.

1 Preparation

1.1 Switch off unit and unplug power cable

1.2 Screw off cabinet feet (four-recessed screws, size 2).

1.3 Place unit on handles at the front, push casing upwards and remove (Fig. 1)

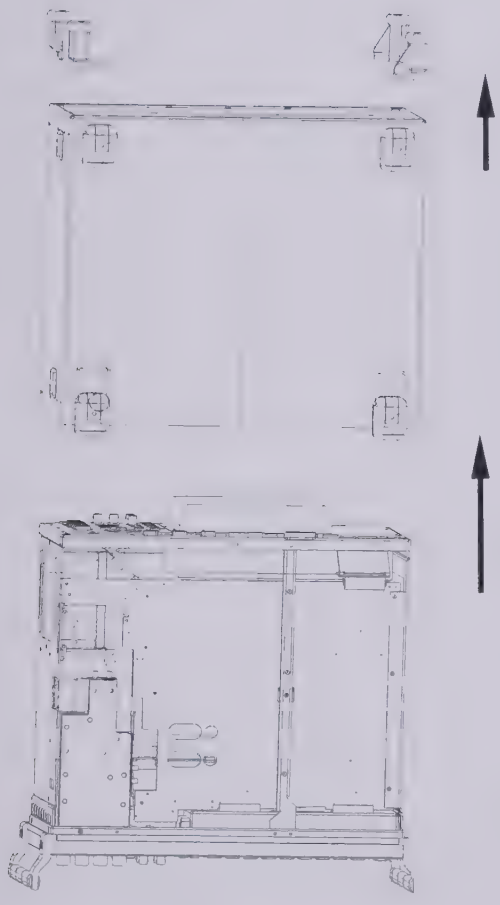


Fig. 1

1.4 Undo four screws from front handles and take off handles

1.5 Undo the countersunk screw (if any) at the front on the labelling panel next to the rollkey and pull panel to the front

1.6 Undo two countersunk screws each from the top and bottom frame at the front as well as two countersunk screws above the AUX1/2 BNC connector at the front

1.7 Undo screw and nut assembly at the top on holding bracket for PCMCIA Interface

1.8 Having taken out the two countersunk screws at top left frame, slightly raise top cover, then push it somewhat to the right and finally remove cover towards the top

1.9 Push the front module to the front by slightly exerting pressure at the back (Fig. 2)

Caution: Beware of the connecting cables for the PCMCIA Interface which are still connected to motherboard 1

1.10 After withdrawing the front module, unplug the three connecting cables of PCMCIA Interface from the motherboard

1.11 Take out the front module completely from the CMU

1.12 Undo two countersunk screws of PCMCIA Interface on the right side of the mounting plate and push the module to the frontside

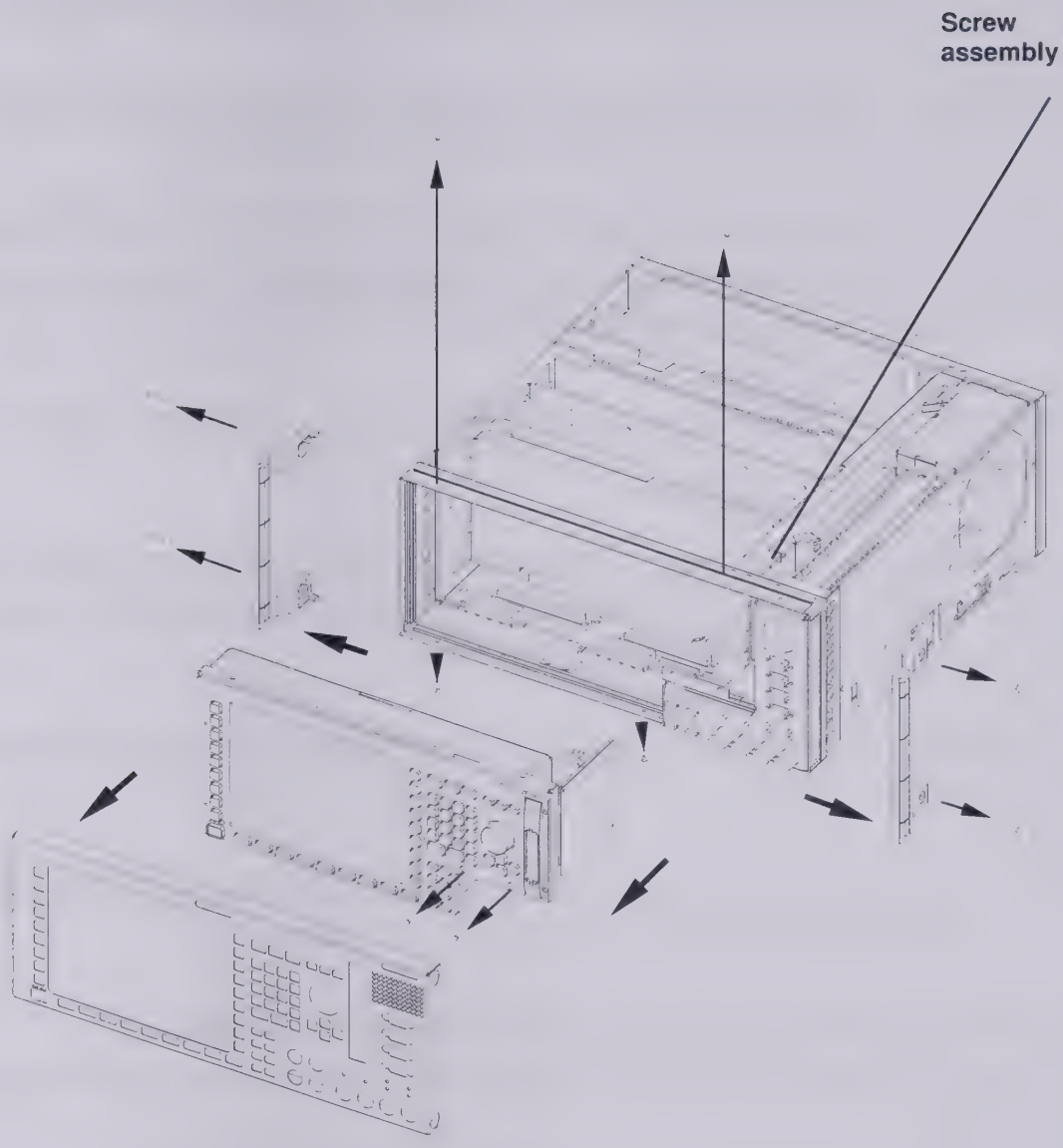


Fig. 2

2 Installation of Option

2.1 Fold up flat cable (Fig. 3)

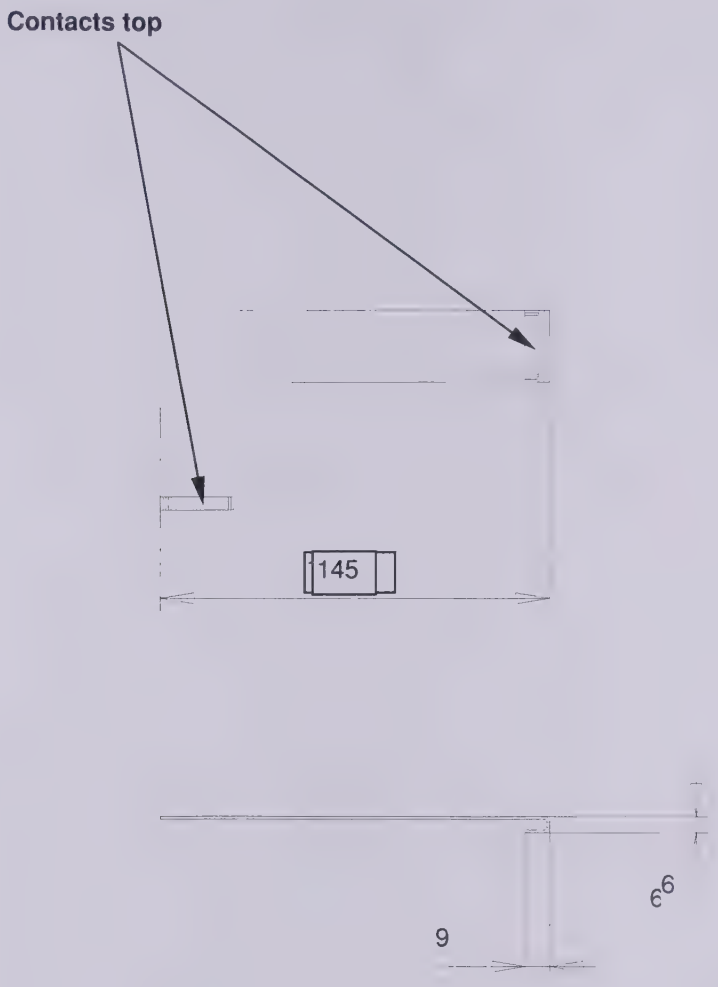


Fig. 3

2.2 Fit floppy drive to holding frame and plug flat cable (Fig. 4)

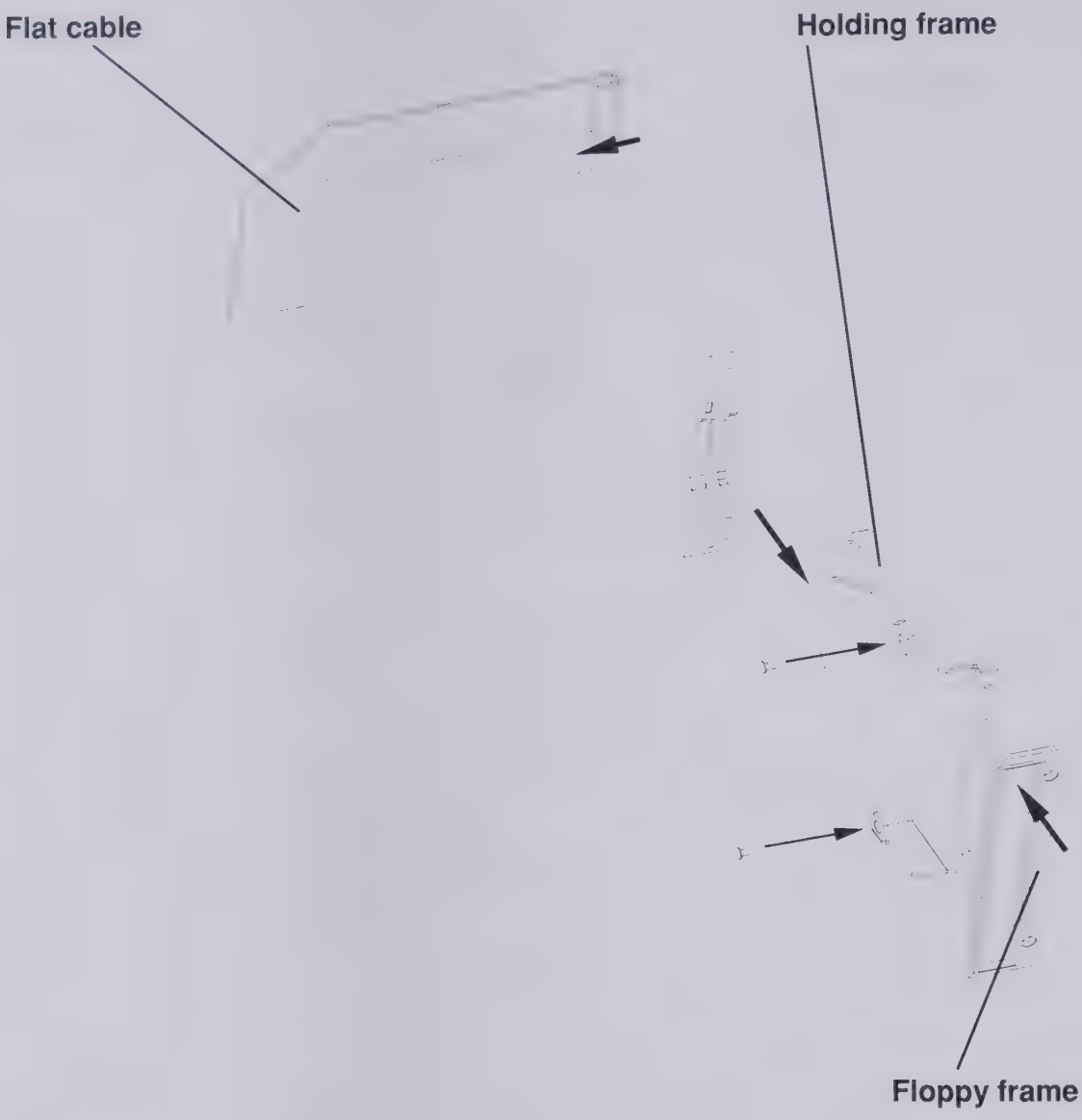


Fig. 4

2.3 Fit floppy drive with frame to front module using two countersunk screws supplied (Fig. 5)

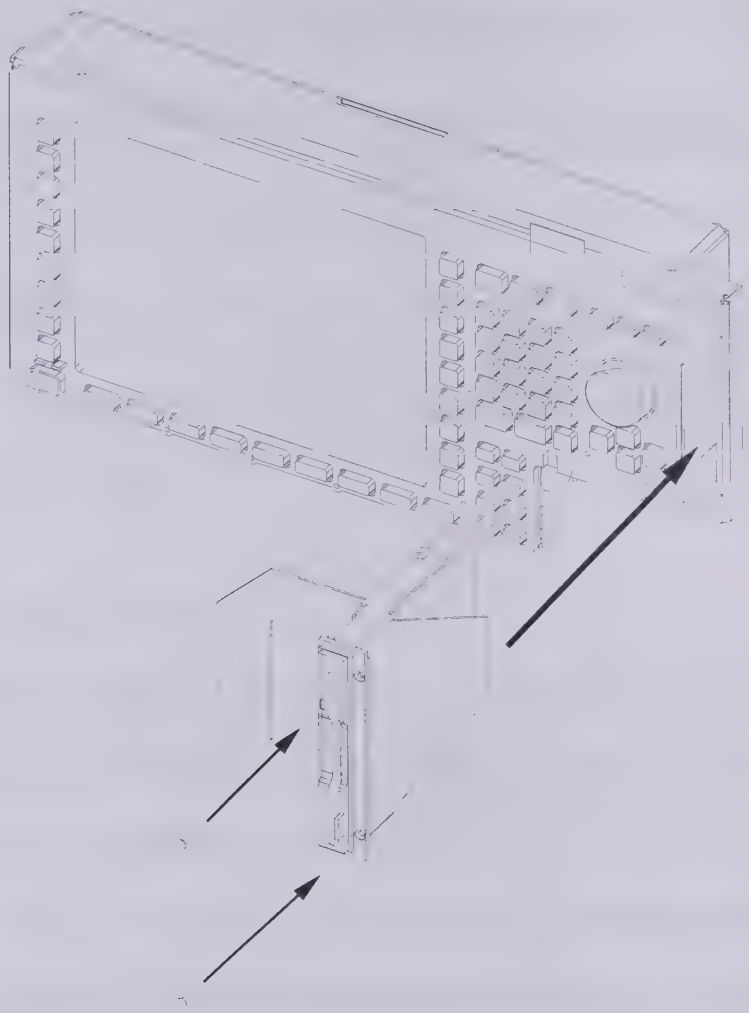


Fig. 5

3 Assembling Unit

3.1 Affixing Label

Affix „CMU-U61“ label on power supply unit (Fig. 6)

CMU-U61 label

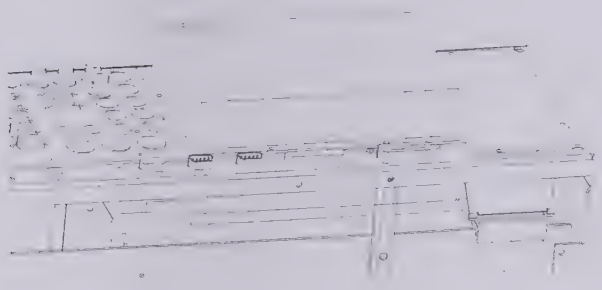


Fig. 6

3.2 Re-Mounting Front-Panel

Mount front module, labelling panel, front handles and casing in the reverse order to that described under 1.4 to 1.11 (Fig. 2)
Connect the free end of flat cable to X218 on the motherboard

3.3 Putting Casing Back

Fit casing and cabinet feet in the reverse order to that described under 1.2 / 1.3 (Fig. 1)

4 Functional Test of Option CMU-U61

4.1 Connect unit to AC supply and switch on

4.2 Enter Floppy Disk Drive into BIOS setup

If PCMCIA Interface is retrofitted on Floppy Disk Drive CMU-U61 or Floppy Disk Drive CMU-U61 is fitted for the first time the following alterations are necessary in BIOS setup:

- Connect external keyboard to the keyboard connector on the rear panel of CMU
- Switch CMU off and on
- Press delete key on external keyboard to enter BIOS setup
- Select "Setup Standard" with cursor keys and confirm with enter
- Select "Floppy A" with cursor keys and confirm with enter
- Select "1.44MB 3.5" with cursor keys and confirm with enter
- Press ESC twice to leave BIOS setup and confirm with enter. CMU starts automatically again.

4.3 Test of Option Detect

Press SETUP hardkey in SYSTEM panel
Press OPTIONS softkey located on the row of keys at bottom of display
➔ Check whether option CMU-U61 is displayed and active

4.4 Test of Option

- Press the key combination ALT and F4 on the external keyboard to enter DOS mode
- Insert disk into floppy disk drive option and enter A: on external keyboard
- Check whether disk is detected and can be read

5 Documents

This chapter contains the documents for the CMU basic unit. The documents for the modules with the description of function, adjustment and interfaces are relegated to the Service Manual, Stock no. 1110.4903.92. To order replacement parts and modules please contact our *spare parts express service* or your Rohde & Schwarz service representative and note the hints given in the following section, "Module and Cable Exchange".

The address of our *spare parts express service* and a list of Rohde & Schwarz representatives can be found at the beginning of this service manual.

Module and Cable Exchange

Table 5-1 at the end of this section lists all power cables available. The stock numbers necessary for ordering replacement parts and modules can be found in the component lists further down.

Important Note!

When replacing a module please note the safety instructions and the repair instructions given in chapter 3 of this service manual.

Ordering replacement parts

To deliver replacement parts promptly and correctly we need the following indications:

- Stock number (see component lists in this chapter)
- Designation
- Component number according to component list
- Number of pieces
- Instrument type the replacement part belongs to
- Contact person for possible questions

Replaced modules

Replaced modules are an economic alternative for original modules. It should be kept in mind that replaced modules are not new, but repaired and fully tested parts. They may have traces from use but they are electrically and mechanically equivalent to new modules.

To find out which replaced modules are available, please refer to your Rohde & Schwarz representative (or to the central service division, Rohde & Schwarz Munich). The identification number is usually the same as for the original module, but with a variant index .95, .96, .97 or .98.

Ordering and delivery of replaced modules

For ordering replaced modules, the same indications as for ordinary parts are required, however, with the corresponding variant index appended to the stock number.

Taking back defective replacement modules

Defective modules of the replacement program which can be repaired are taken back within **3 months** after delivery of the replaced module. A repurchasing value is credited.

Excluded are parts which can not be repaired, e.g. PCBs that are burnt, broken or damaged by repair attempts, incomplete modules, parts which are heavily damaged mechanically.

The defective parts must be sent back with a **returned accompanying document** containing the following information:

- Stock number, serial number and designation of the dismounted part,
- **Precise** description of the error,
- Stock number, serial number and designation of the instrument the part was dismounted from,
- Date of dismounting,
- Name of the technician who exchanged the part.

A returned accompanying document is provided with each replacement module.

Table 5-1 List of power cables available

Stock No.	Earthed-contact connector	Preferably used in
DS 006.7013	BS1363: 1967 complying with IEC 83: 1975 standard B2	Great Britain
DS 006.7020	Type 12 complying with SEV-regulation 1011.1059, standard sheet S 24 507	Switzerland
DS 006.7036	Type 498/13 complying with US-regulation UL 498, or with IEC 83	USA/Canada
DS 006.7107	Type SAA3 10 A, 250 V, complying with AS C112-1964 Ap.	Australia
DS 0025.2365 DS 0099.1456	DIN 49 441, 10 A, 250 V, angular DIN 49 441, 10 A, 250 V, straight	Europe (except Switzerland)

ROHDE&SCHWARZ

Overview of

Spare Parts

for CMU Basic Unit

List of CMU Spare Parts

The CMU is constructed in accordance with R&S design 2000.

Overall dimension: W x H x L, 465 mm x 193 mm x 517 mm

Rackmount: 4E 1/1 T450

Note: *The parts which are fitted with a Current No. can be ordered as spare parts.*

Current No.	Designation	Stock No.	Electr.No.
10	Instrument frame	1090.9080.00	
80	Instrument fan	1091.1001.00	
90	Instrument fan cover	1091.0840.00	
150	Cover	1100.0872.00	
170	Cage	1091.0111.00	
180	Part of the mounting plate	1091.0028.00	
190	Partition	1091.0128.00	
200	Locking bracket	1091.0405.00	
210	Loudspeaker	1100.0837.00	E 1
220	Loudspeaker support	1091.0640.00	
220	Cover hood large	0009.9200.00	
230	Cover hood small	0143.4180.00	
240	Cover hood medium	0528.8500.00	
250	Sub D cover (9-pins)	1050.9243.00	
260	Labeling panel	1100.0143.00	

270	FRONT MODULE MODEL 04=COLOR DISPLAY 48 MB / FMR4	1090.9244.04	A 1
275	FRONT MODULE MODEL 12=COLOR DISPLAY 64 MB / FMR5	1090.9244.12	A 1

Current No.	Designation	Stock No.	Electr.No.
280	Keyboard frame	1091.1153.00	
290	Keyboard mat	1100.0166.00	
300	Keyboard membrane	1100.2008.00	A 15
310	Mounting plate	1090.9680.00	
320	Shielded filter plate	1091.2014.00	
330	RF Spring long	1069.3011.00	
340	RF Spring short	1069.3105.00	
350	Plate support	0852.0844.00	
360	LCD VAR 04	0048.4435.00	A 14
365	LCD VAR 12	0048.6980.00	A 14
370	Display connector VAR 04	1091.0286.00	W 17
375	Display connector VAR 12	1091.0911.00	W 17
380	Spinwheel VAR 04	0852.1140.00	B 12
385	Spinwheel VAR 12	0852.1134.00	B 12
390	Rotary knob	0852.1086.00	
400	Shielding VAR 04	1090.9838.00	
405	Shielding VAR 12	1091.1030.00	
410	DC/AC converter VAR 04	0048.3568.00	T 3
415	DC/AC converter VAR 12	0048.6996.00	T 3
420	Converter connector VAR 04	1091.2214.00	W 13
425	Converter connector VAR 12	1091.0928.00	W 13
430	Hood VAR 04	1090.9844.00	

Current No.	Designation	Stock No.	Electr.No.
435	Hood VAR 12	1091.1024.00	
440	Panel	1090.9650.00	
450	FRONT MODULE CONTROLLER VAR 04	1091.2108.00	A 4
455	FRONT MODULE CONTROLLER VAR 12	1091.2489.00	A 4
460	Lithium battery	0565.1687.00	
470	Memory MODULES 16 MB (SIMM –72) VAR 04	0010.9369.00	
475	Memory MODULES 32 MB (SODIMM –144) VAR 12	0048.5654.00	
480	Memory MODULES 32 MB (SIMM –72) VAR 04	0048.5025.00	
485	Memory MODULES 64 MB (SODIMM –144) VAR 12	4054.9518.00	
490	Hard disk program.VAR 04	1090.9250.00	D 11
495	Hard disk program.VAR 12	1100.0989.00	D 11
510	Fan VAR 04	1090.9867.00	E 10
515	Fan VAR 12	1091.0292.00	E 10
520	RF FRONTEND	1100.3042.02	A 20
530	Fan	1100.3088.00	
540	REFERENCE BOARD	1100.2600.02	A 10
550	RX/TX BOARD1	1100.1404.02 1100.1733.02[1]	A 3
555	TR CORRECTION MODULE	1100.1604.02	A 301
560	Reserved		
565	Reserved		

[1] New RXTX BOARD1 1100.1733.02 replaces old RXTX BOARD1 1100. 1404.02. 1100.1703.02 cannot be replaced by 1100.1404.02.

Current No.	Designation	Stock No.	Electr.No.
570	DIGITAL BOARD	1100.1791.02	A 7
575	DIGITAL BOARD	1100.1804.02	A 700
580	DDC MODULE1	1100.2300.03	A 710
585	DDC MODULE2	1100.2300.03	A 730
590	AUC MODULE1	1100.2500.02	A 760
595	AUC MODULE2	1100.2500.02	A 780
600	TXDSP MODULE1	1100.2100.03	A 750
605	TXDSP MODULE2	1100.2100.03	A 770
610	ADC MODULE1	1100.2200.02	A 720
615	ADC MODULE2	1100.2200.02	A 740
620	MOTHERBOARD1	1100.1110.02 1100.0920.02[2, ♣]	A 200
630	MOTHERBOARD2	1100.1127.02 1100.0937.02[3, ♣]	A 201
640	REARPANEL BOARD1	1100.1140.02 1100.0950.02[4, ♣]	A 204
650	REARPANEL BOARD2	1100.1191.02 1100.0966.02[5, ♣]	A 202
660	FRONTPANEL BOARD	1100.1204.02 1100.0943.02[6, ♣]	A 203
670	POWER SUPPLY	1091.2320.00	A 100
	CMU-B11 OCXO REFERENCE OSC.	1100.5000.02	
690	OCXO REFERENCE OSC.	1100.2900.02	
	CMU-B12 OCXO REFERENCE OSC.	1100.5100.02	

2 New MOTHERBOARD1 1100.0920.02 replaces old MOTHERBOARD1 1100.1110.02. 1100.0920.02 cannot be replaced by 1100.1110.02.

3 New MOTHERBOARD2 1100.0937.02 replaces old MOTHERBOARD2 1100.1127.02. 1100.0937.02 cannot be replaced by 1100.1127.02.

4 New REARPANEL BOARD1 1100.0950.02 replaces old REARPANEL BOARD1 1100.1140.02. 1100.0950.02 cannot be replaced by 1100.1140.02.

5 New REARPANEL BOARD2 1100.0966.02 replaces old REARPANEL BOARD2 1100.1191.02. 1100.0966.02 cannot be replaced by 1100.1191.02.

6 New FRONTPANEL BOARD 1100.0943.02 replaces old FRONTPANEL BOARD 1100.1204.02. 1100.0943.02 cannot be replaced by 1100.1204.02.

Current No.	Designation	Stock No.	Electr.No.
710	OCXO REFERENCE OSC.	1100.2900.03	
	CMU-B21 UNIVERS.SIGN.UNIT	1100.5200.02	
730	UNIV. SIGN. UNIT	1100.5216.02[7] 1100.5216.03[8]	A 8 / A 9
735	LINK HANDLER BOARD	1097.3570.02	A 400
740	DSP MODULE0	1097.3106.03[9] 1097.3129.03[9]	A 440
741	DSP MODULE1	1097.3106.03[9] 1097.3129.03[9]	A 450
742	DSP MODULE2	1097.3106.03[9] 1097.3129.03[9]	A 460
750	I/Q OUT MODULE	1100.2000.02	A 430
	CMU-B41 AUDIO-GEN. + ANA.	1100.5300.02	
755	AUDIO BOARD	1100.2800.02	A11
756	DSP MODULE	1097.3106.03[9] 1097.3129.03[9]	A1101
757	RF cable	1100.3659.00	W 34*
758	RF cable	1100.3665.00	W 40*
	CMU-B52 SPEECH CODEC	1100.5400.02	A 420
760	SPEECH CODEC	1100.2730.02	
765	DSP MODULE3	1097.3106.03[9] 1097.3129.03[9]	A 470
	CMU-U61 FLOPPY DISK DRIVE	11005500.02	
780	Floppy	1091.2072.00	
790	Support	1091.0228.00	

7 1100.5216.02 contains DSP MODULES 1097.3106.03 and I/Q OUT MODULE 1100.2000.02

8 100.5216.03 contains DSP MODULES 1097.3129.03 and I/Q OUT MODULE 1100.2000.02

9 New DSP MODULE 1097.3129.03 replaces old DSP MODULE 1097.3106.03. 1097.3129.03 cannot be replaced by 1097.3106.03.

* If one of the new boards (620...660) is used, all other boards (620...660) must be replaced.

Current No.	Designation	Stock No.	Electr.No.
800	Frame	1091.0211.00	
810	Flex strip connection	1091.2066.00	
830	PCMCIA INTERFACE	1100.5616.02	
840	Card slot	1047.2006.00	
850	RF cable	1100.3894.00	W 5*
860	RF cable	1100.3907.00	W 6*
870	RF cable	1100.3913.00	W 7*
880	RF cable	1100.3920.00	W 8*
910	RF cable	1100.3965.00	W 12*
920	RF cable	1100.3971.00	W 13*
930	RF cable	1100.3988.00	W 14*
940	RF cable	1100.4010.00	W 17*
950	RF cable	1100.4026.00	W 18*
960	RF cable	1100.4032.00	W 19*
970	RF cable	1100.4155.00	W 31*
980	RF cable	1100.4161.00	W 32*
990	RF cable	1100.4178.00	W 33*
1000	RF cable	1100.4190.00	W 35*
1010	RF cable	1100.4203.00	W 36*
1020	RF cable	1100.4210.00	W 37*

9 New DSP MODULE 1097.3129.03 replaces old DSP MODULE 1097.3106.03. 1097.3129.03 cannot be replaced by 1097.3106.03.

* as shown in drawing 1100.0872 sheet 1.

* as shown in drawing 1100.0872 sheet 1.

Current No.	Designation	Stock No.	Electr.No.
1030	Tube	1100.0743.00	
1040	Front grip	1096.1480.00	
1050	Screw	1096.4780.00	
1060	Rear panel foot	1096.2493.00	
1070	Instrument foot	1096.2506.00	
1080	Clamp	1096.2529.00	
1090	Tube hood	1096.2558.00	

ROHDE&SCHWARZ

Drawings of all

CMU Spare Parts

ROHDE&SCHWARZ

Circuit Diagram

Part List

Adjustment Devices

for CMU Basic Unit

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
.	XX VARIANTENERKLAERUNG IDENTIFICATION OF MODELS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL				
A1	ZE FRONTMODUL FRONT MODULE	1090.9244.12			
A3	EE RX/TX BOARD RX/TX BOARD	1100.1733.02			
A7	ZE DIGITALBOARD DIGITAL BOARD	1100.1791.02			
A10	EE REFERENCE BOARD REFERENCE BOARD	1100.2600.02			
A20	ED RF FRONTEND RF FRONTEND	1100.3120.02			
A100	GJ NETZTEIL 230W UL/CSA POWER SUPPLY	1091.2320.00	PULS	SN230	
A102	PCMCIA INTERFACE CMU B12 PCMCIA INTERFACE	1100.5616.02			
A200	ED MOTHERBOARD 1 MOTHERBOARD 1 ENTHALTEN IN 1100.0908.02 CONTAINED IN 1100.0908.02	1100.0920.02			
A201	ED MOTHERBOARD 2 MOTHERBOARD 2 ENTHALTEN IN 1100.0908.02 CONTAINED IN 1100.0908.02	1100.0937.02			
A202	ED FRONTPANEL BOARD FRONT PANEL BOARD ENTHALTEN IN 1100.0908.02 CONTAINED IN 1100.0908.02	1100.0943.02			
A203	ED REARPANEL BOARD 1 FRONT PANEL BOARD ENTHALTEN IN 1100.0908.02 CONTAINED IN 1100.0908.02	1100.0950.02			
A204	ED REARPANEL BOARD 2 REAR PANEL BOARD 2 ENTHALTEN IN 1100.0908.02 CONTAINED IN 1100.0908.02	1100.0966.02			
A700	EE DIGITAL BOARD DIGITAL BOARD	1100.1804.02			1100.1791.01
A710	ED DDC MODULE DDC MODULE	1100.2300.03			1100.1791.01
A720	EE ADC MODULE ADC MODULE	1100.2200.02			1100.1791.01
A750	EE TXDSP MODULE TXDSP MODULE	1100.2100.03			1100.1791.01
A760	ED AUC MODULE AUC MODULE	1100.2500.02			1100.1791.01
D11	ZE HARD DISK PROGR. HARD DISK PROGR.	1100.0989.00			
E1	ZM LAUTSPRECHER SPEAKER	1100.0837.00			
E10	ZM LUEFTER	1091.1001.00			1090.9209.00
W5	DV HF-KABEL CMU200 RF-CABLE	1100.3894.00			
W6	DV HF-KABEL RF-CABLE	1100.3907.00			
W7	DV HF-KABEL RF-CABLE	1100.3913.00			
W8	DV HF-KABEL RF-CABLE	1100.3920.00			
W11	DY FLACHBANDKABEL W11 CABLE W11	1091.0734.00			
W12	DV HF KABEL RF CABLE	1100.3965.00			
W13	DV HF-KABEL	1100.3971.00			
W14	DV HF-KABEL	1100.3988.00			
W17	DV HF KABEL RF CABLE	1100.4010.00			
W18	DV HF KABEL RF CABLE	1100.4026.00			
W19	DV HF KABEL RF CABLE	1100.4032.00			

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
W31	DV HF KABEL RF CABLE	1100.4155.00			
W32	DV HF-KABEL RF CABLE	1100.4161.00			
W33	DV HF KABEL RF CABLE	1100.4178.00			
W35	DV HF KABEL RF CABLE	1100.4190.00			
W36	DV HF KABEL RF CABLE	1100.4203.00			
W37	DV HF KABEL RF CABLE	1100.4210.00			
W215	DY KABEL W215 CABLE W215	1100.1227.00			
W223	DY KABEL W223 CABLE W223	1100.1233.00			
W224	DY KABEL W224 CABLE W224	1100.1240.00			

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
.	XX VARIANTENERKLAERUNG IDENTIFICATION OF MODELS				
C1	CC 68PF+-1% 50VNPO 0603	CC 0009.9746.00	MURATA	GRM39C0G***F50ZPT	
..44	SMD-CERAMIC-CAPACITOR				
C45	CC 10NF+-10% 50VHDK 0603	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
..47	SMD-CERAMIC-CAPACITOR				
C48	CC 100NF+-10%16V HDK 0603	CC 1097.6292.00	TDK	C1608X7R1C104KT	
..52	CERAMIC CHIP CAPACITOR				
C53	CC 470PF+-10%50V HDK 0603	CC 0009.4896.00	MURATA	GRM39X7R***K50C500	
..69	SMD-CERAMIC-CAPACITOR				
C70	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C71	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C72	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C73	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C74	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C75	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C76	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C77	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C78	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C79	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C80	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C81	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C82	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C83	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C84	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C85	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C86	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C87	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C88	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C89	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C90	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C91	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C92	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C93	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C94	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C95	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C96	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C97	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C98	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C99	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C100	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C101	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				
C102	CC 10P+-0,1PF50V NPO 0603	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
	SMD-CERAMIC-CAPACITOR				

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1CMK 000 3PLU	Äl	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr Page
ROHDE&SCHWARZ	03	27.03.00	ED MOTHERBOARD-SET	1100.0908.01 SA	1+

095.0026.0693

Kennz Comp No	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C103	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C104	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C105	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C106	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C107 ..111	CC 470PF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4896.00	MURATA	GRM39X7R***K50C500	
C112	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C113	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C114	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C115	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C116 ..133	CC 470PF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4896.00	MURATA	GRM39X7R***K50C500	
C134 ..147	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C148 ..152	CC 470PF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4896.00	MURATA	GRM39X7R***K50C500	
C153	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C154	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C155	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C156	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C157	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C158	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C159	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C160	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C161	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C162	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C163	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C164	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C165	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C166	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C167	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C168	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C169 ..171	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C172	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C173	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C174	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C175	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C176	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C177	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C178	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C179	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C180	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C181	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C182	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C183	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C184	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C185	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C186	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C187	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C188 ..198	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C199 ..216	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C217	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C218	CC 470NF+-10%50V X7R 1812 CERAMIC CHIP CAPACITOR	CC 0007.7498.00	AVX	1812 5C 474KA T00F	
C219	CE 10UF+-20%16V RUND SMD SMD ELECTROLYTIC CAPACIT.	0010.7914.00	PANASONIC	EEV-HB1C100R	
C220	CE 10UF+-20%16V RUND SMD SMD ELECTROLYTIC CAPACIT.	0010.7914.00	PANASONIC	EEV-HB1C100R	
C221	CC 150NF+-10%50V X7R 1210 CERAMIC CHIP CAPACITOR	CC 0007.7446.00	AVX	1210 5C 154KAT00F	
C222	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C223	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C224	CC 47OPF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4896.00	MURATA	GRM39X7R***K50C500	
C225	CE 100UF+-20%16V RUND SMD SMD-ELECTOLYTIC CAPACIT.	CE 0009.6553.00	SANYO	16CV100F(G)S	
C226	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C227	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C228 ..242	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C243	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C244	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C245	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C246	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C247	CC 68PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9746.00	MURATA	GRM39C0G***F50ZPT	
C248	CC 68PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9746.00	MURATA	GRM39C0G***F50ZPT	
D4 ..8	BL PC74HCT245T 8XTRANSC OCTAL BUS TRANSCEIVER	BL 0007.5414.00	PHILIPS_SE	(PC)74HCT245(D/T)	
F1	RK 0,2A FUSE PTC 0,8W SMD RESETTABLE FUSE	2080.6990.00	BOURNS	MF-MSMD020	
F2	RK 0,2A FUSE PTC 0,8W SMD RESETTABLE FUSE	2080.6990.00	BOURNS	MF-MSMD020	
F3	RK 1,5A"FUSE PTC"1,9W SMD RESETTABLE FUSE	1081.0290.00	BOURNS	MF-SM-150-2	
F4 ..17	RK 0,2A FUSE PTC 0,8W SMD RESETTABLE FUSE	2080.6990.00	BOURNS	MF-MSMD020	
H1 ..9	AF LGS269B0 GRUEN LED LED	0009.8362.00	SIEMENS	LG S269-B0 (Q1570)	
H11 ..16	AF HLMP1719 LED3 GE585N LED	AF 0099.9140.00	QUALITY	HLMP-1719.L31S	
N140	BO LM2904D 2X VF OPAMP VOLTAGE FEEDBACK OPAMP	6024.4010.00	PHILIPS_SE	LM2904D	
N141	BO LM2904D 2X VF OPAMP VOLTAGE FEEDBACK OPAMP	6024.4010.00	PHILIPS_SE	LM2904D	
R1 ..7	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	

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Kennz. Comp. No.	Benennung Designation		Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R8	RG 33K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7066.00	PHILIPS_CO	RC 22 H	
R9 ..11	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R12	RG 75K +-1% TK100 SMD RESISTOR EIA0603	0603	2074.8937.00	DRALORIC	CR 0603	
R13	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R14	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R15	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R16	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R17	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R18	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R19	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R20	RG 2K74 +-1% TK100 SMD RESISTOR EIA0603	0603	0010.8410.00	PHILIPS_CO	RC 22 H	
R21	RG 13K +-1% TK100 SMD RESISTOR EIA0603	0603	1097.6428.00	PHILIPS_CO	RC 22 H	
R22 ..24	RG 61R9 +-1%TK100 SMD RESISTOR EIA0603	0603	0048.4841.00	PHILIPS_CO	RC 22 H	
R25	RG 1K82 +-1% TK100 SMD RESISTOR EIA0603	0603	0010.8404.00	PHILIPS_CO	RC 22 H	
R26	RG 2KO +-1% TK100 SMD RESISTOR EIA0603	0603	1097.6328.00	PHILIPS_CO	RC 22 H	
R27 ..30	RG 4K7 +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7020.00	PHILIPS_CO	RC 22 H	
R31	RG 68OR +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6982.00	PHILIPS_CO	RC 22 H	
R32 ..63	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R64 ..104	RG 61R9 +-1%TK100 SMD RESISTOR EIA0603	0603	0048.4841.00	PHILIPS_CO	RC 22 H	
R105	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R106	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R107	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R108	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R109	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R110	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R111	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R112	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R113	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R114	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R115	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R116	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R117	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R118	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R119 ..132	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R133 ..164	RG 68R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6930.00	PHILIPS_CO	RC 22 H	
R165	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R166	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R167	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	
R168	RG O-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 O OHM	

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Kennz. Comp. No.	Benennung Designation		Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R169	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R170	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R171	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R172	RG 68R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6930.00	PHILIPS_CO	RC 22 H	
R173	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R174	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R175	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R176	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R177	RG OR75 5% 1W SMD RESISTOR	1218	1100.3671.00	PHILIPS_CO	PRC201-OR75 1% TK250	
R178 ..184	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	PHILIPS_CO	RC 22 H	
R185 ..200	RG 27,4 OHM+-1%TK100 SMD RESISTOR EIA0603	0603	0009.9046.00	PHILIPS_CO	RC 22 H	
R201	RG OR1 5% 1W SMD-RESISTOR	1218	6100.7785.00	PHILIPS_CO	PRC201-OR1 1% TK700	
R202	RG 200K +-1% TK100 SMD RESISTOR EIA0603	0603	1093.6200.00	PHILIPS_CO	RC 22 H	
R203	RG 200K +-1% TK100 SMD RESISTOR EIA0603	0603	1093.6200.00	PHILIPS_CO	RC 22 H	
R204	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R205	RG 1K37 +-1% TK100 SMD RESISTOR EIA0603	0603	1097.6111.00	PHILIPS_CO	RC 22 H	
R206	RG 5K62 +-1% TK100 SMD RESISTOR EIA0603	0603	0010.8433.00	PHILIPS_CO	RC 22 H	
R207	RG 13K +-1% TK100 SMD RESISTOR EIA0603	0603	1097.6428.00	PHILIPS_CO	RC 22 H	
R208	RG 150K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7095.00	PHILIPS_CO	RC 22 H	
R209	RG 2K2 +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7008.00	PHILIPS_CO	RC 22 H	
R210	RG 22K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7050.00	PHILIPS_CO	RC 22 H	
R211	RG 22K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7050.00	PHILIPS_CO	RC 22 H	
R212	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	PHILIPS_CO	RC 22 H	
R213	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	PHILIPS_CO	RC 22 H	
R214	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	PHILIPS_CO	RC 22 H	
R215	RG 4K32 +-1% TK100 SMD-RESISTOR EIA0603	0603	0048.6438.00	PHILIPS_CO	RC 22 H	
R216	RG 4K32 +-1% TK100 SMD-RESISTOR EIA0603	0603	0048.6438.00	PHILIPS_CO	RC 22 H	
R217 ..228	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R229	RG 1KO +-1% TK100 CHIP RESISTOR	1206	RG 0006.7271.00	ROEDERSTEI	D25	
R230	RG 100K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5363.00	PHILIPS_CO	RC 22 H	
R231	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R232	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R233	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R234	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R235	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R236	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	PHILIPS_CO	RC 22 H	
R237	RG 61R9 +-1%TK100 SMD RESISTOR EIA0603	0603	0048.4841.00	PHILIPS_CO	RC 22 H	
R238	RG 0-OHM WIDERSTAND SMD RESISTOR EIA0603	0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R239	RG 20K +-1% TK100 SMD RESISTOR EIA0603	0603	0010.9100.00	PHILIPS_CO	RC 22 H	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R240	RG 15K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7043.00	PHILIPS_CO	RC 22 H	
R241	RG 15K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7043.00	PHILIPS_CO	RC 22 H	
R242	RG 82K5 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.9123.00	PHILIPS_CO	RC 22 H	
R243	RG 12K1 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8462.00	PHILIPS_CO	RC 22 H	
R244	RG 12K1 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8462.00	PHILIPS_CO	RC 22 H	
R245	RG 392K+-1% TK100 0603 RESISTOR	1097.6528.00	PHILIPS_CO	RC 22 H	
R246	RG 220K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7108.00	PHILIPS_CO	RC 22 H	
R247	RG 220K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7108.00	PHILIPS_CO	RC 22 H	
R248	RG 1K91 +-1% TK100 0603 SMD RESISTOR EIA0603	1097.6128.00	PHILIPS_CO	RC 22 H	
R249 ..257	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	PHILIPS_CO	RC 22 H	
R258 ..261	RG 220R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6953.00	PHILIPS_CO	RC 22 H	
R262	RG 0-OHM WIDERSTAND 0603 SMD RESISTOR EIA0603	0009.9369.00	PHILIPS_CO	RC21 0 OHM	
R263	RG 61R9 +-1%TK100 0603 SMD RESISTOR EIA0603	0048.4841.00	PHILIPS_CO	RC 22 H	
V1 ..7	AG PBYR245CT 2X45V 2A SCHOTTKY RECTIFIER DIODE	0009.5311.00	PHILIPS	PBYR245CT	
V8 ..21	AG SS24 SGL 40V 2A SCHOTTKY RECTIFIER	1081.1880.00	GEN_INSTRU	SS24	
V22	AK BC860B P 45V 150MA TRANSISTOR	AK 0007.7975.00	MOTOROLA	BC860B	
V23	AK BC850B N 45V 100MA TRANSISTOR	AK 0007.7969.00	VALVO	BC850B	
V24	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V25	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V26	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V27	AK BCP68-16 N 20V 1A MEDIUM POWER TRANSISTOR	AK 0008.2019.00	PHILIPS	BCP68-25	
V28	AG PBYR245CT 2X45V 2A SCHOTTKY RECTIFIER DIODE	0009.5311.00	PHILIPS	PBYR245CT	
V29	AG SS24 SGL 40V 2A SCHOTTKY RECTIFIER	1081.1880.00	GEN_INSTRU	SS24	
V30	AG SS24 SGL 40V 2A SCHOTTKY RECTIFIER	1081.1880.00	GEN_INSTRU	SS24	
W205	DY KABEL W205 CABLE W205	1100.1085.00			
W206	DY KABEL W206 CABLE W206	1100.1091.00			
W207	DY KABEL W207 CABLE W207	1100.1056.00			
W208	DY KABEL W208 CABLE W208	1100.1062.00			
W219	DY KABEL W219 CABLE W219	1100.1079.00			
X10	FP BUCHSENLEISTE 96P.WINK CONNECTOR	6056.1746.00	BERG_ELEKT	89037-101	
X11	FP BU.LEISTE COMP.BUS110P CONNECTOR	1093.6546.00	ERNI	064176	
X12	FP BUCHSENLEISTE 96P.WINK CONNECTOR	6056.1746.00	BERG_ELEKT	89037-101	
X21	FP BUCHSENLEISTE 96POL. FEMALE MULTIPOINT CONNECT	FP 0272.9129.00	DEUT_ELCO	20 8457 096 004 025	
X22	FP BUCHSENLEISTE 96POL. FEMALE MULTIPOINT CONNECT	FP 0272.9129.00	DEUT_ELCO	20 8457 096 004 025	
X31	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	
X41	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	
X51	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X52	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	
X61	FP BUCHSENLEISTE 96POL. FEMALE MULTIPOINT CONNECT	FP 0272.9129.00	DEUT_ELCO	20 8457 096 004 025	
X62	FP STECKERLEISTE 48P.GER CONNECTOR	0386.6340.00	BERG_ELEKT	70233-111	
X63	FP BUCHSENLEISTE 96POL. FEMALE MULTIPOINT CONNECT	FP 0272.9129.00	DEUT_ELCO	20 8457 096 004 025	
X71	FP STECKERLEISTE 48P.GER CONNECTOR	0386.6340.00	BERG_ELEKT	70233-111	
X72 ..75	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	
X81	FP BUCHSENLEISTE 96POL. FEMALE MULTIPOINT CONNECT	FP 0272.9129.00	DEUT_ELCO	20 8457 096 004 025	
X82	FP STECKERLEISTE 48P.GER CONNECTOR	0386.6340.00	BERG_ELEKT	70233-111	
X83	FP BUCHSENLEISTE 96POL. FEMALE MULTIPOINT CONNECT	FP 0272.9129.00	DEUT_ELCO	20 8457 096 004 025	
X91	FP STECKERLEISTE 48P.GER CONNECTOR	0386.6340.00	BERG_ELEKT	70233-111	
X92	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	
X93	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	
X101	FP STECKERLEISTE 48P.GER CONNECTOR	0386.6340.00	BERG_ELEKT	70233-111	
X110	FP BUCHSENLEISTE 96P.WINK CONNECTOR	6056.1746.00	BERG_ELEKT	89037-101	
X111	FP STECKERLEISTE 96P.GER. CONNECTOR	1100.4410.00	BERG_ELEKT	88953-105	
X200	FP STECKERLEISTE 10P.GER CONNECTOR 10P	0846.4593.00	SIEMENS	V23535-A2200-A102	
X201 ..204	FJ EINBAUSTECKER F.GS SMB PLUG	FJ 0063.5168.00	ROSENBERGE	59S106-400-D3	
X205 ..208	FP STIFTLEISTE 34P.COD. CONNECTOR	1100.3788.00	SAMTEC	STMM-117-01-G-D	
X209	FP STIFTLEISTE 2P.R2,54 PIN CONNECTOR	FP 0010.7014.00			
X210	FP STIFTLEISTE 3P.R2,54 PIN CONNECTOR	FP 0009.6101.00			
X211	FP STECKERLEISTE 3P.GER CONNECTOR	FP 6014.4324.00	J_S_T_DEUT	B3P-VH	
X212	FP BUCHSENLEISTE 10P.WINK CONNECTOR	1091.2366.00	MPE	BL22-47AGG-10 BZ0457	
X213	FP STECKERLEISTE 50P.WIN CONNECTOR 50P.	FP 1051.4545.00	BERG_ELEKT	86453-550	
X214	FP STIFTLEISTE 50P.COD. CONNECTOR	1100.3794.00	SAMTEC	STMM-125-01-G-D	
X215 ..217	FP STIFTLEISTE 34P.COD. CONNECTOR	1100.3788.00	SAMTEC	STMM-117-01-G-D	
X218	FP BUCHSENLEISTE 26P.ZIF CONNECTOR	1091.2137.00	MOLEX	MLX52030-2610	
X219	FP STIFTLEISTE 50P.COD. CONNECTOR	1100.3794.00	SAMTEC	STMM-125-01-G-D	
X220	FP STIFTLEISTE 2P.R2,54 PIN CONNECTOR	FP 0009.5992.00			
X221	FJ EINBAUSTECKER F.GS SMB PLUG	FJ 0063.5168.00	ROSENBERGE	59S106-400-D3	
X222	FP STIFTLEISTE 34P.COD. CONNECTOR	1100.3788.00	SAMTEC	STMM-117-01-G-D	
X223	FP STIFTLEISTE 50P.COD. CONNECTOR	1100.3794.00	SAMTEC	STMM-125-01-G-D	
X224	FP STIFTLEISTE 50P.COD. CONNECTOR	1100.3794.00	SAMTEC	STMM-125-01-G-D	
X225	FP STIFTLEISTE 4P.R2,54 PIN CONNECTOR	FP 0009.8462.00			
X250	FM BUCHSENLEISTE 15P. HD CONNECTOR	1091.2189.00	AMP	216281-1	
X251	FM STECKERLEISTE 9P.WRAP CONNECTOR	FM 0614.3777.00	FCT	F09P4G1	
X252	FM STECKERLEISTE 9P.WRAP CONNECTOR	FM 0614.3777.00	FCT	F09P4G1	
X253	FM BUCHSENLEISTE 25P.WRAP CONNECTOR 25P.	FM 0680.2375.00	FCT	F25S4G1	
X254	FO EINBAUBUCHSE 6P.F.GS CONNECTOR	1100.3871.00	YAMAICHI	MDIN06K	
X255	FM BUCHSENLEISTE 24P.F.GS CONNECTOR	1100.2237.00	AMP	554501-2	

41

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Kennz. Comp No	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X301	FM STECKERLEISTE 9P.WRAP CONNECTOR	FM 0614.3777.00	FCT	F09P4G1	
X302	FM STECKERLEISTE 9P.WRAP CONNECTOR	FM 0614.3777.00	FCT	F09P4G1	
X303	FM BUCHSENLEISTE 15P. HD CONNECTOR	1091.2189.00	AMP	216281-1	
X304	FM BUCHSENLEISTE 9P.WRAP CONNECTOR	FM 0614.3760.00	FCT	F09S4G1	
X305 ..308	FJ EINBAUSTECKER F.GS SMB PLUG	FJ 0063.5168.00	ROSENBERGE	59S106-400-D3	
X450	FM BUCHSENLEISTE 9P.WRAP CONNECTOR	FM 0614.3760.00	FCT	F09S4G1	
X451	FM BUCHSENLEISTE 9P.WRAP CONNECTOR	FM 0614.3760.00	FCT	F09S4G1	
X452 ..454	FM BUCHSENLEISTE 15P. HD CONNECTOR	1091.2189.00	AMP	216281-1	

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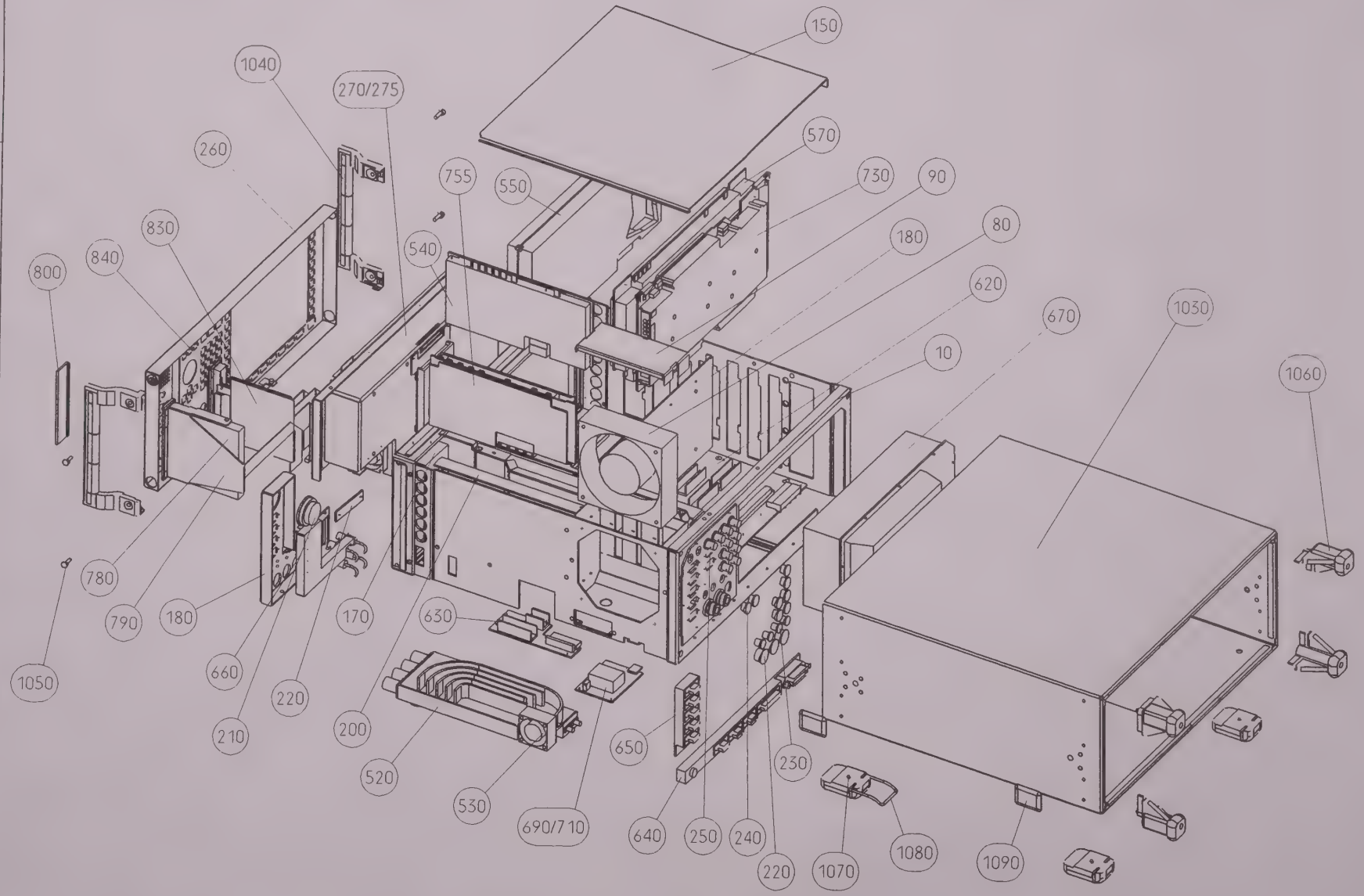

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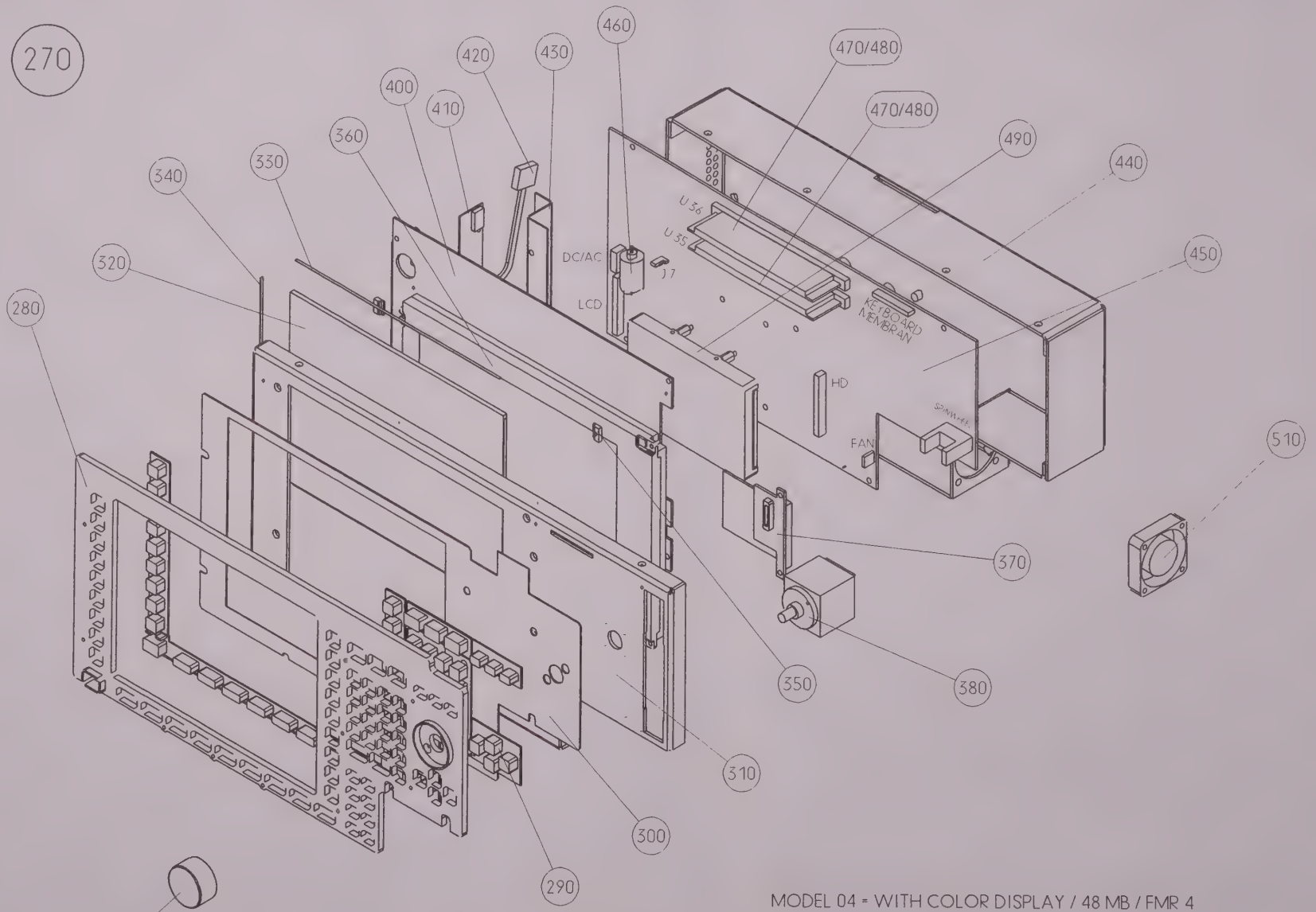
				Gepr					
Änd Index	Änderungs-Mitteilung	Datum	Name	Norm					
				Plot			zu Gerät		regiv / erste Z

Projektion Methode E



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MODEL 04 = WITH COLOR DISPLAY / 48 MB / FMR 4

15:00		28.04.99	Bi	TCMK	Datum	Name	
				Bearb	28.04.99	Bi	
				Gepr			
Änd Index	Änderungs-Mitteilung	Datum	Name	Norm			
				Plot			

ROHDE&SCHWARZ

zu Gerät

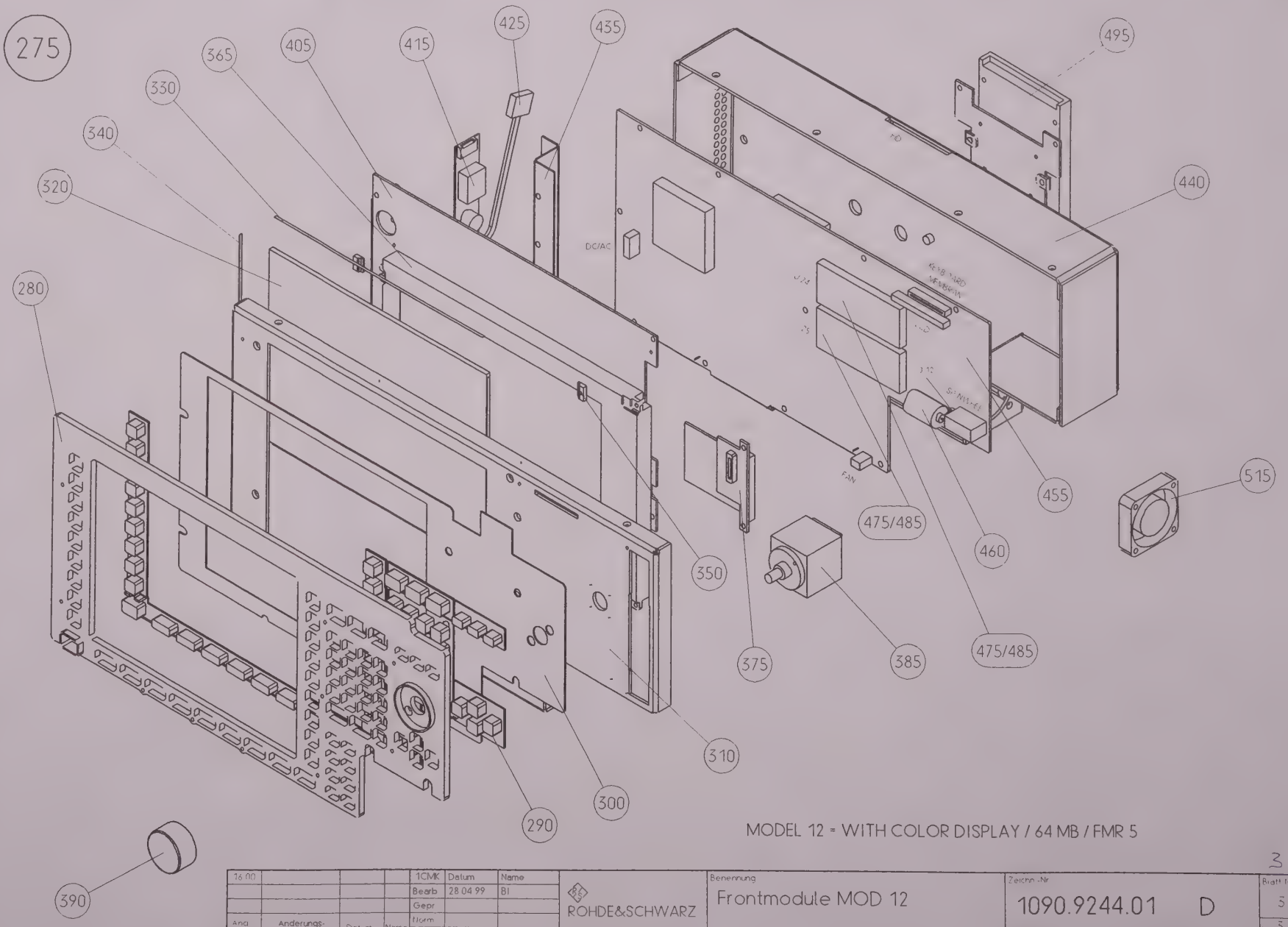
Benennung: Frontmodule MOD 04

Zeichn. Nr: 1090.9244.01 D

Blatt Nr: 2

regiv | erste Z

ISO-Projektion Methode E



MODEL 12 = WITH COLOR DISPLAY / 64 MB / FMR 5

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				Bearb	28.04.99	BI	
				Gepr			
Änd. Index	Änderungs-Mitteilung	Datum	Name	Norm			
				Plot			

ROHDE&SCHWARZ

zu Gerät

Benennung: Frontmodule MOD 12

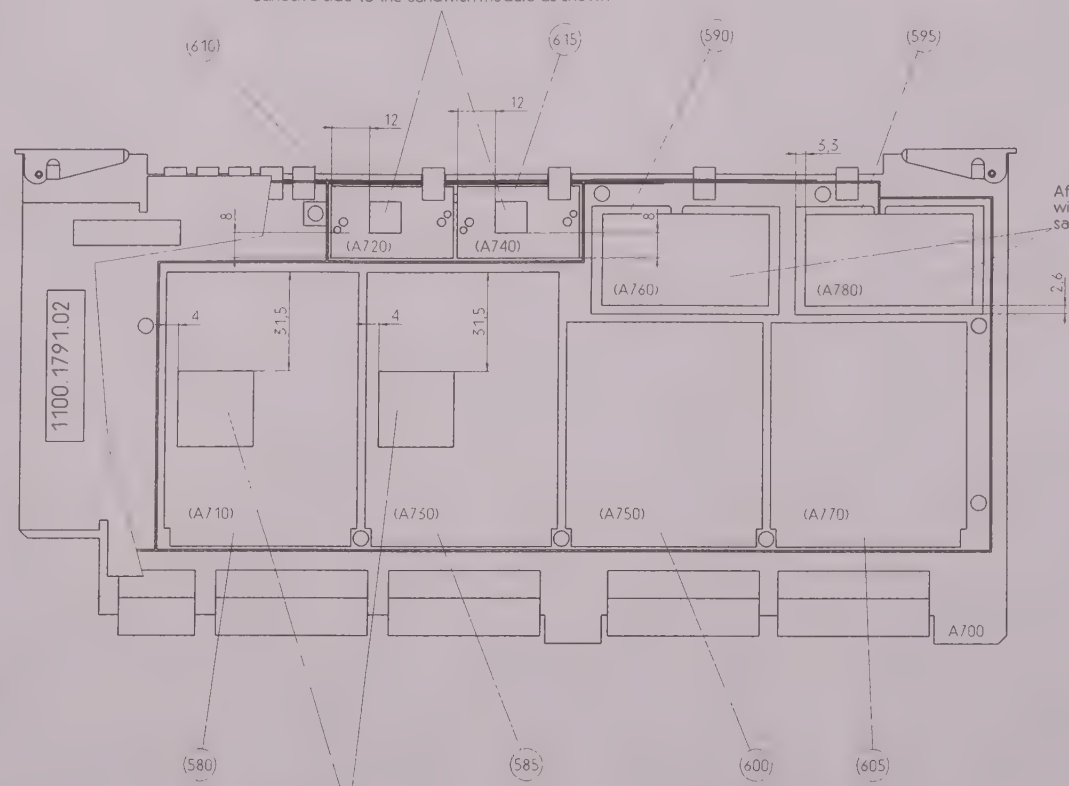
Zeichn.-Nr: 1090.9244.01 D

Blatt-Nr: 3 / 3 Bl

reg.: V | erste:

570

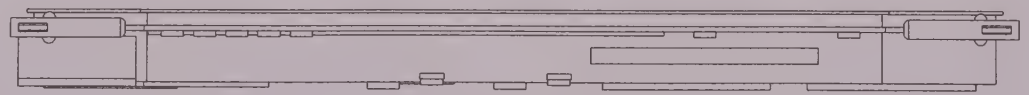
Affix the supplied heat conducting mat with its adhesive side to the sandwich module as shown



Affix the supplied conducting mat with its adhesive side to the sandwich module as shown

(575)

Affix the supplied heat conducting mat with its adhesive side to the sandwich module as shown



4

							Maßstab	1 : 1	
							Werkstoff		
							Benennung	DIGITALBOAPD	
							Sach-Nr.	1100 179101	D
							ROHDE&SCHWARZ		Blatt-Nr. 2

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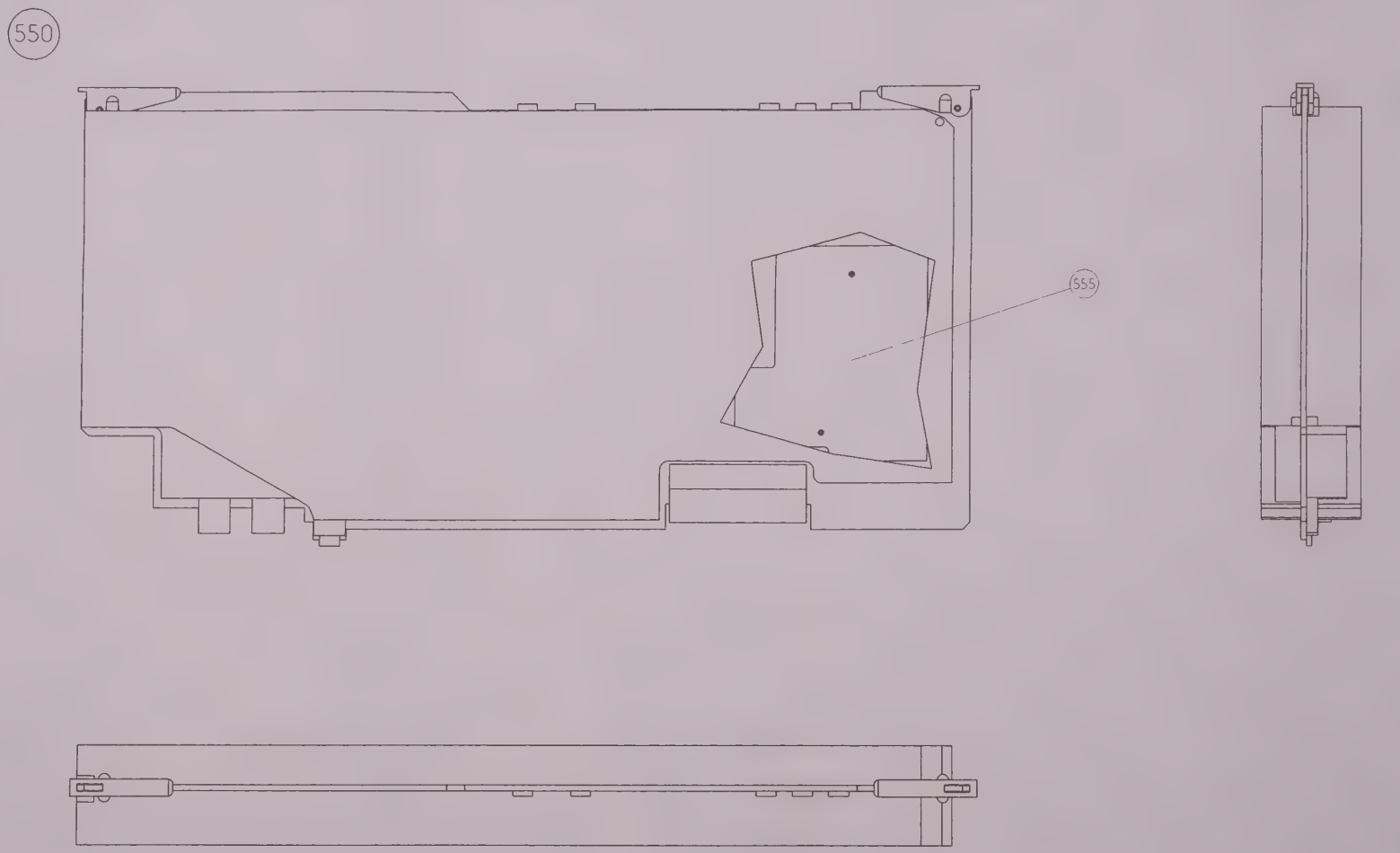

5

				Maße ohne Toleranzangabe		Maßstab 1:1	
						Kreisstatt	
08.97				1256	Datum	Name	Benennung RX/TX BOARD
				Bearb.	28.07.94	Bi	
				Gepr.			
				Norm			
				Blatt			
Änd. Index	Änderungs-Mitteilung	Datum	Name	POHDE&SCHWARZ			Zeichn.-Nr. 1100.1404.01 D Blatt-Nr. 3 2 8
				zu Gerät CMU			Ers.f. ersetzt Z 1100.0008.01

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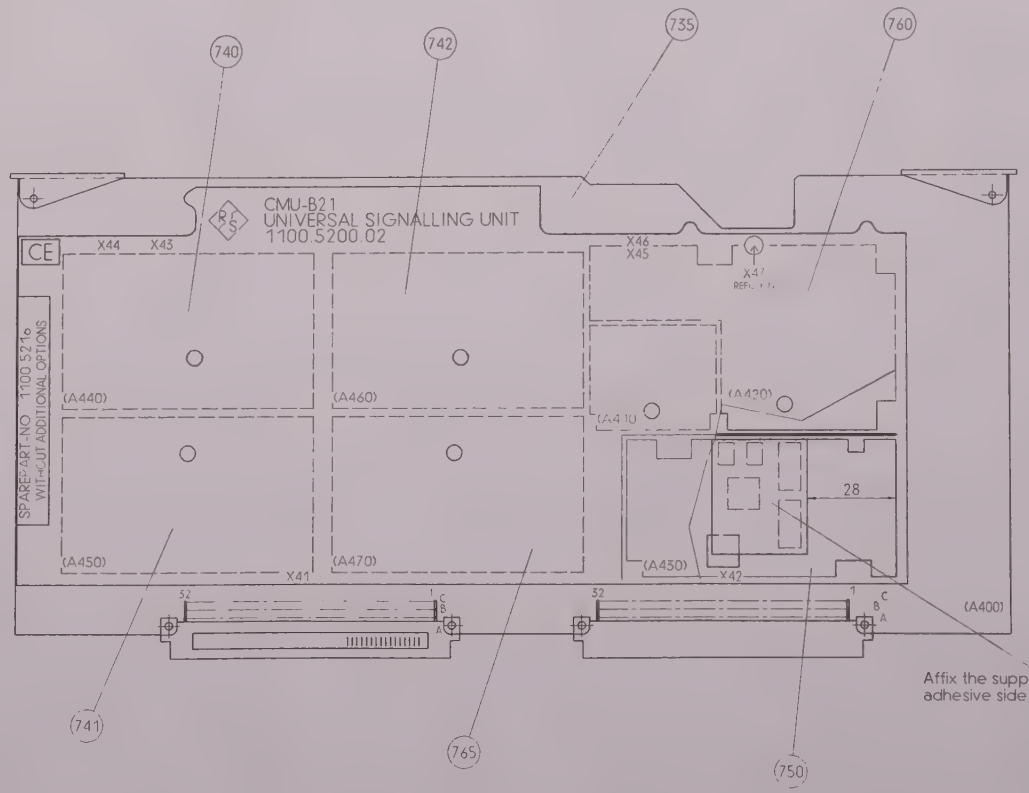
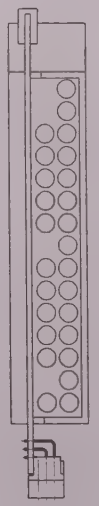
730





Affix the supplied heat conducting mat with its adhesive side to the sandwich module as shown

6

		Maßstab 1:1	
07.00		Name	Benennung: UNIVERS SIGN UNIT
		Plot	
		ROHDE&SCHWARZ	Zeichn.-Nr 1100.5216.01 D / Blatt-Nr 02
		CMU-B21	1100.5200.00 / 1100.5200.01

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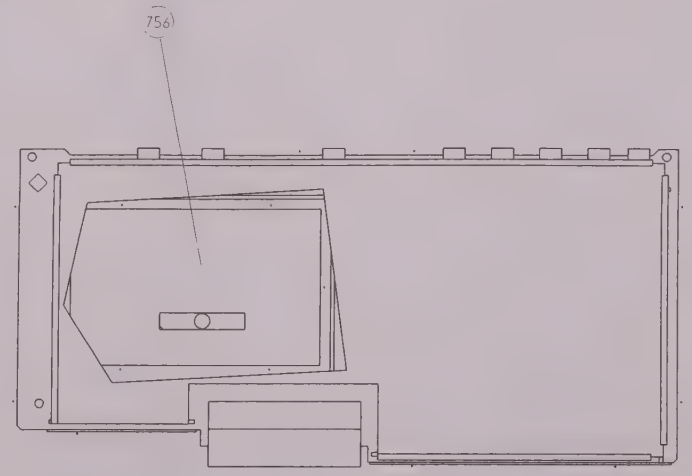
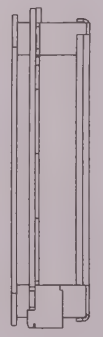
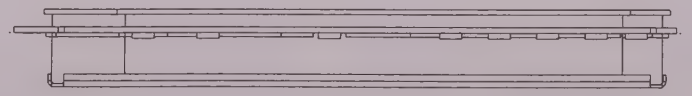
755







7

		Name	Datum	Änderungsnummer	Blatt-Nr.
					1 1
		Bearb.		Benennung	
		Gepr.		AUDIO BOARD	
		Norm			
		Ers. f.		Zeichn.-Nr.	
				1100 2800 01 D	
Ers. durch:	Änderungsnr. Mitteilung	Datum	Name	Ersetzt durch:	Ersetzt:
					1100 2008 01

PHOHDE&SCHWARZ

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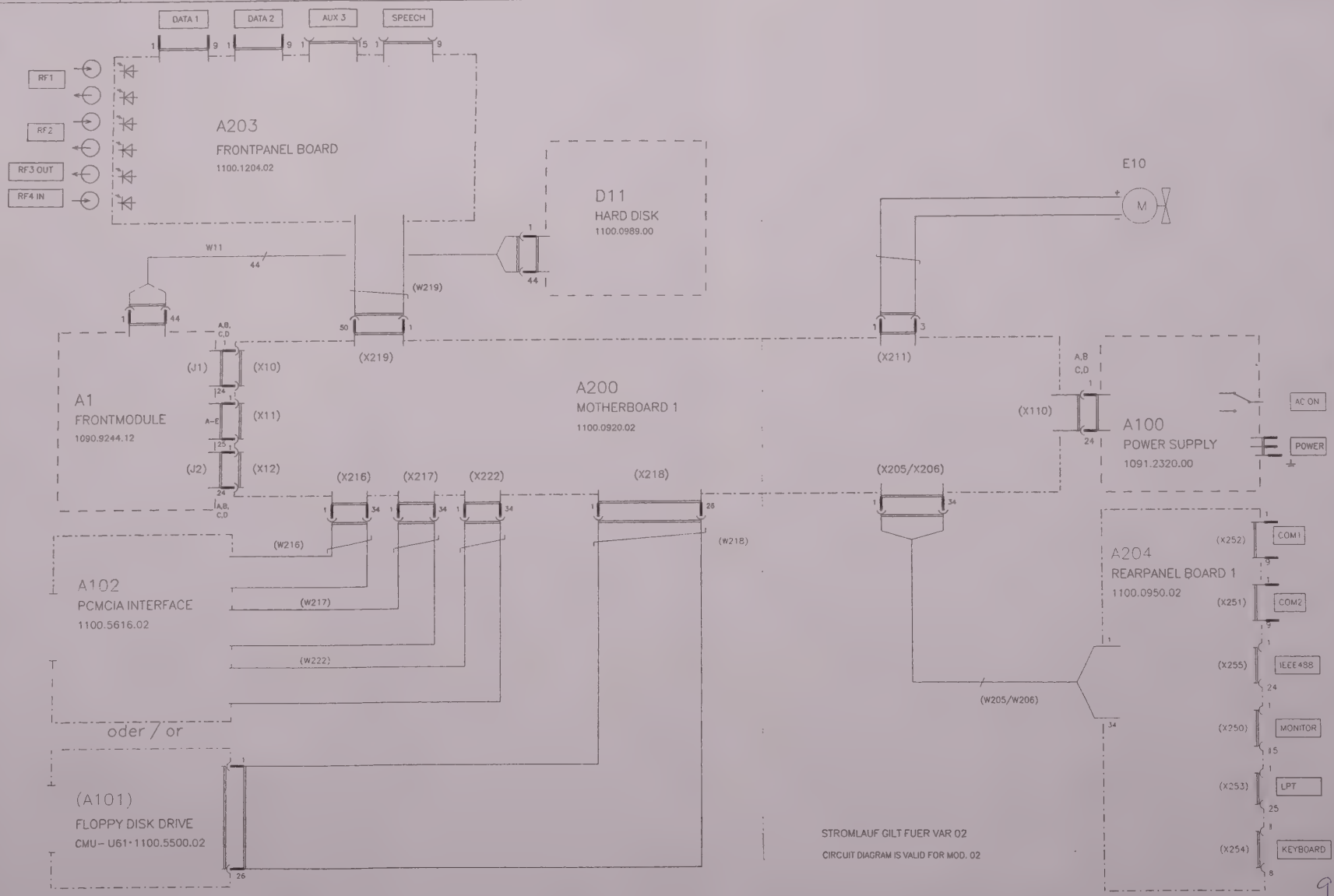

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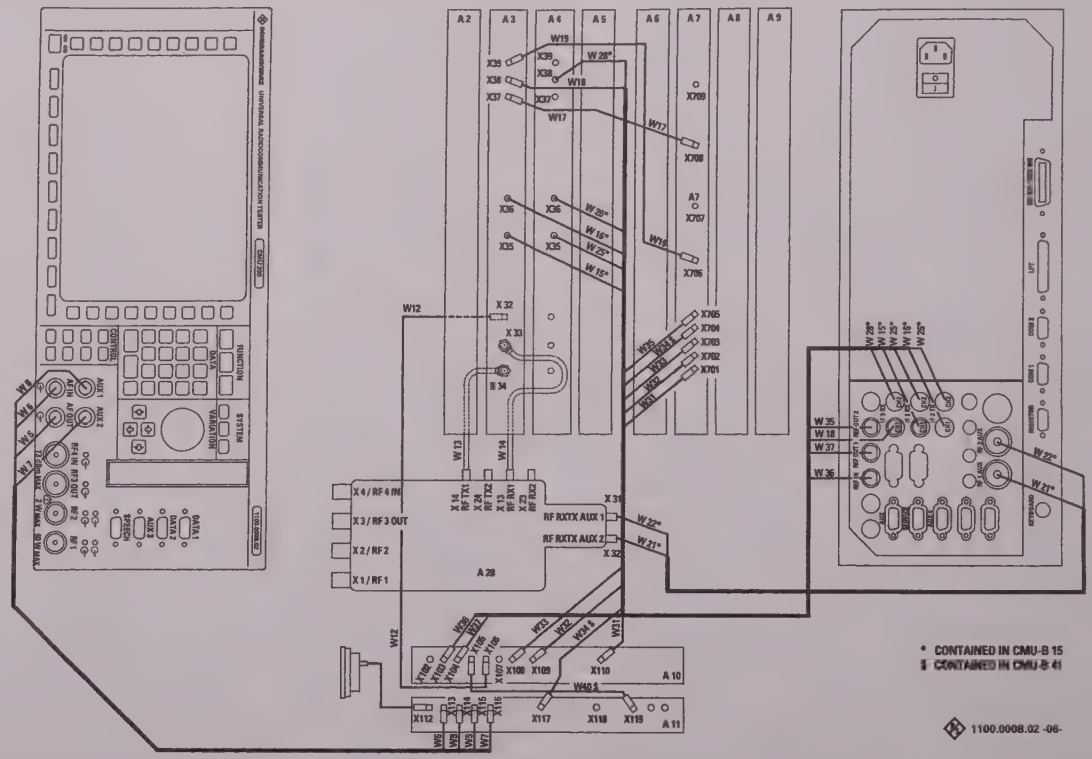
| | | |



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1100.0872 DV -07- Deckel (bedr.) 1CMK/No. 11.98 07 ---- 09.99 No.

14

Beschriftung: tiefschwarz WU 002.2823

hierzu Druckvorlage 1100.0872 DV -07-

bearbeitet aus 1091.0657

Änd. Index	Änderungs-Mitteilung	Datum	Name
07	----	09.99	Bi

Maße ohne Toleranzangabe

Maßstab *ohne*

Halbzeug,Werkstoff

	Datum	Name
Bearb.	11.98	Bi
Gepr.		
Norm		

Benennung: **Deckel** *(bedr.)* Z

ROHDE&SCHWARZ

Zeichn.-Nr. **1100.0872** Blatt-Nr. v. Bl.

zu Gerät *CMU* reg. i. V. *1100.0008.00 V* erste Z. *1100.0008.01*

ISO-Projektion Methode E

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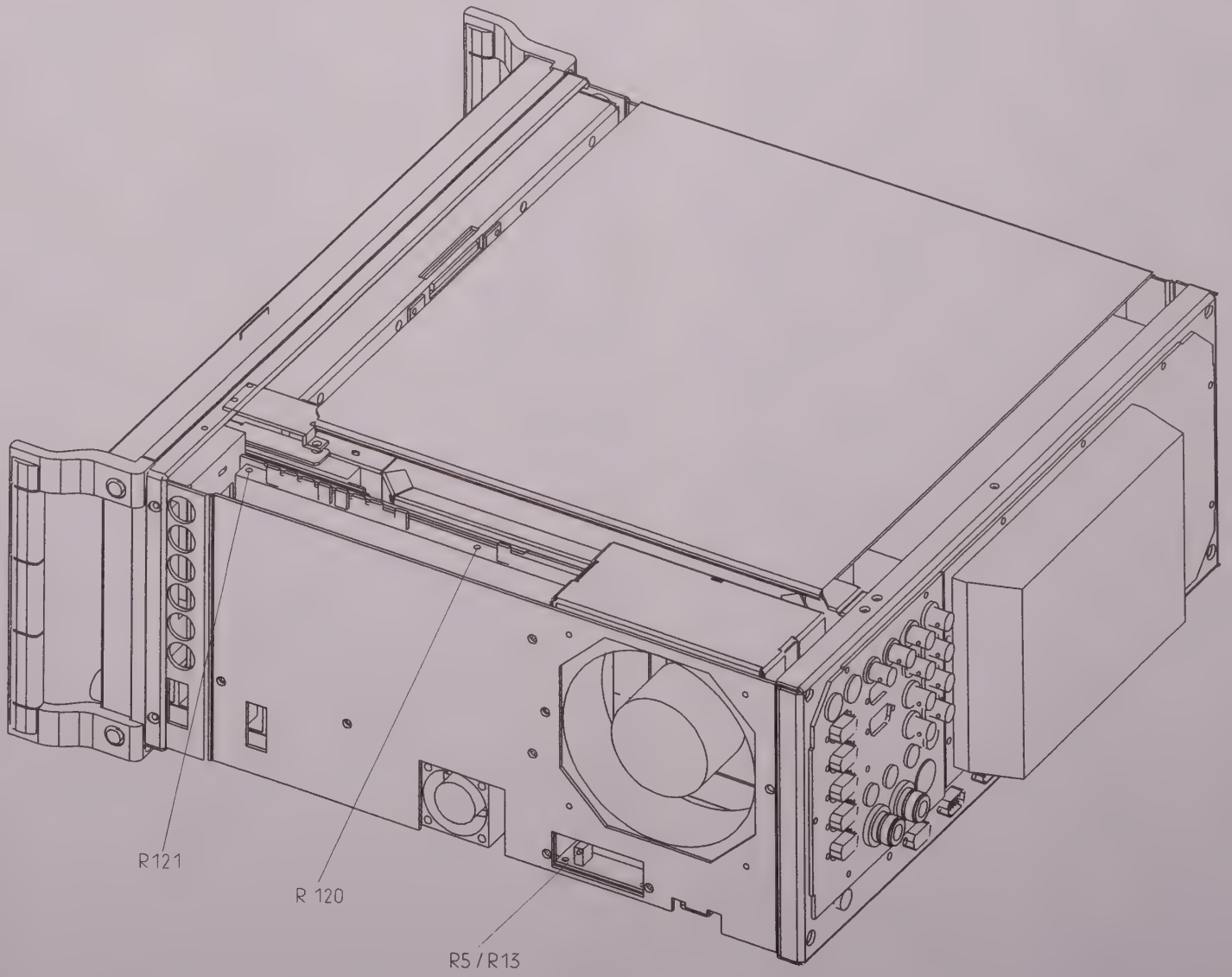

15

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06.00						
				Bearb.	03.05.99	Bi
				Gepr.		
And. index	Anderungs-Mitteilung	Datum	Name	Norm		
				Plot		

ROHDE&SCHWARZ

zu Gerat

Benennung: GG CMU200 UNIV.RADIOCOM.

Zeichn.-Nr.: 1100.0008.01 D

Blatt-Nr: 3

v. Bl

regiv

erste

Projektion Methode E

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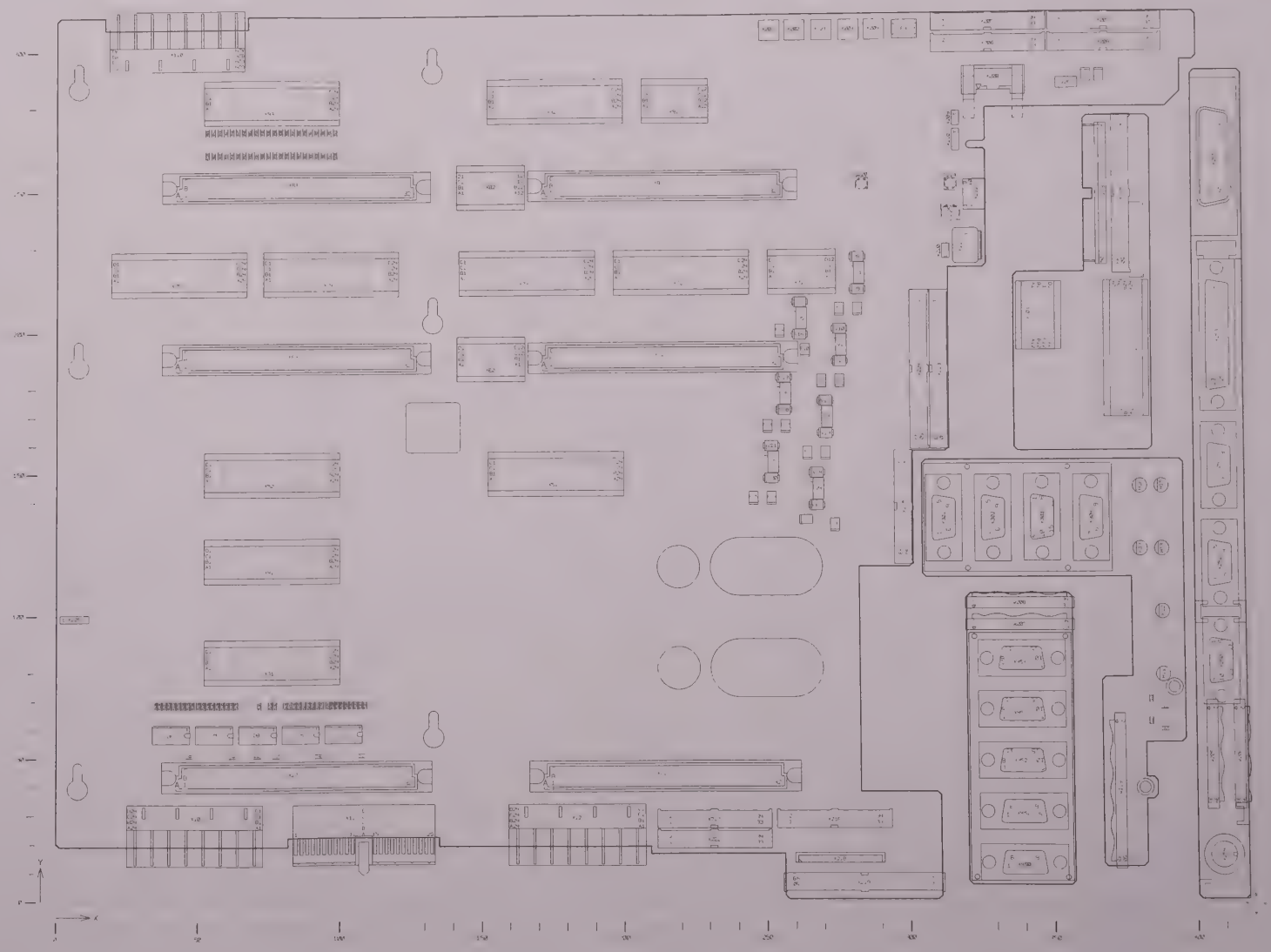


DARSTELLUNG SEITE B
VIEW ON SIDE B

ACHTUNG: ESD!
ATTENTION: ESD!

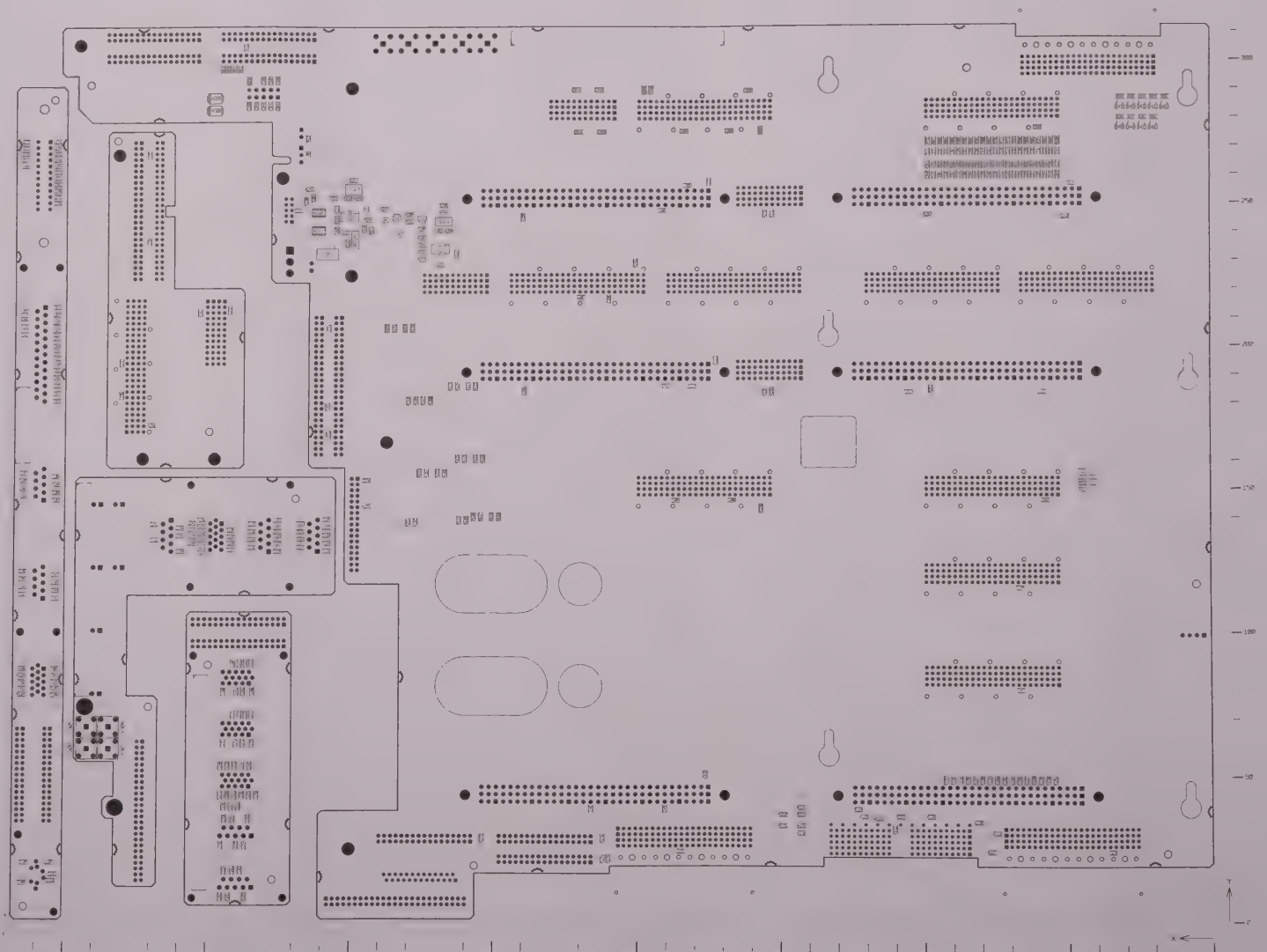
FOR BINDING INFORMATION ON MODELS, TRIMMING AN COMPONENT VALUES AND NOT FITTED COMPONENTS SEE PARTS LIST

ROHDE&SCHWARZ

MOTHERBOARD

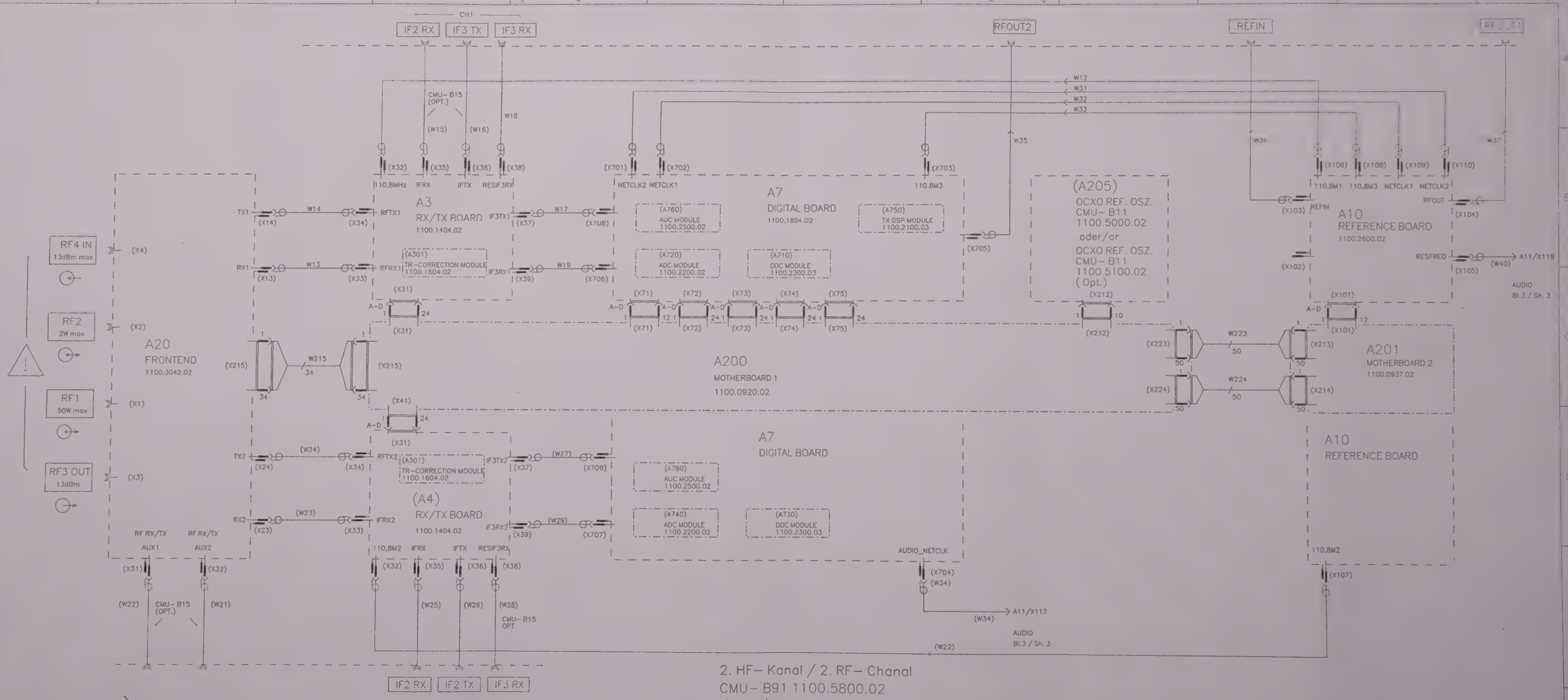
Type OXU	Datum 98-10-08	Name KRAETSCH	de	02.00	1+
Index . 1100.0008			Zeichnungs-Nr. 1100.0908.01 D		

36

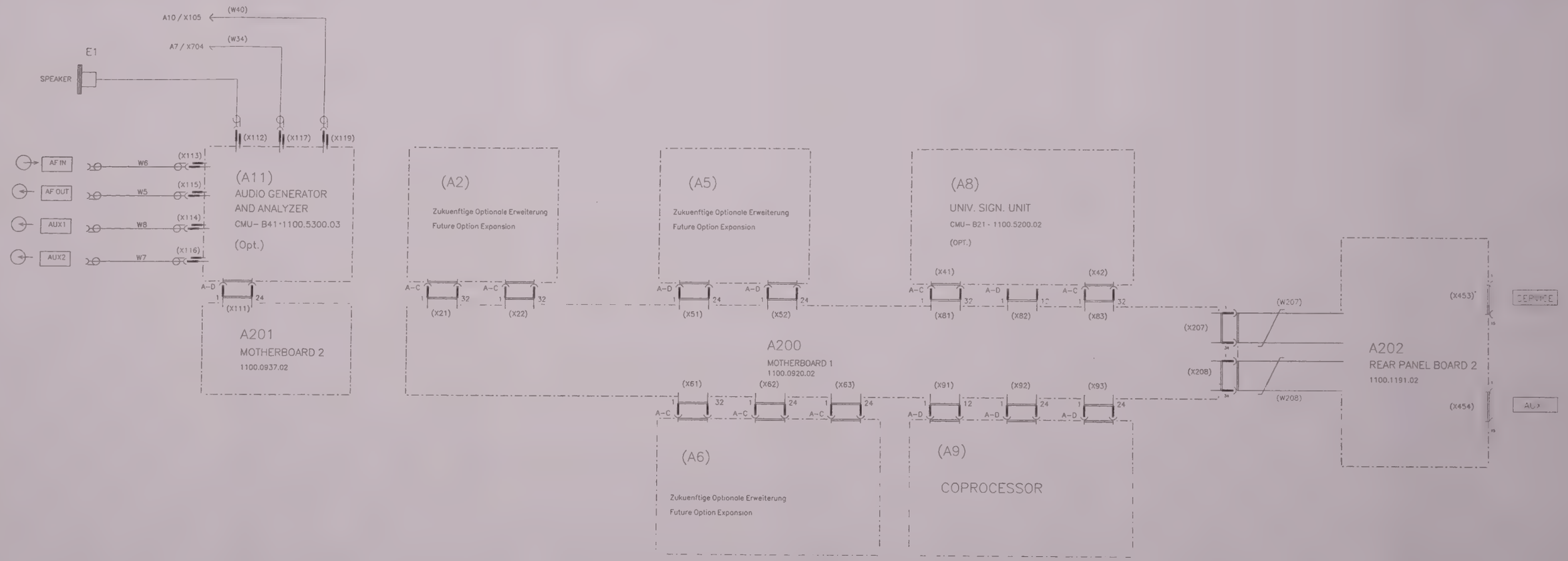


DARSTELLUNG SEITE A
VIEW ON SIDE A

ROHDE&SCHWARZ | MOTHERBOARD | de | 02.00 | 1100.0908.01 D


CH1
IF2 RX
IF3 TX
IF3 RX
RFOUT2
REFIN
RF_11
CMU– B15 (OPT.)
W18
(W15)
(W16)
W12
W31
W32
W33
W35
W36
W37
(X32)
(X35)
(X36)
(X38)
110,8MHz
IFRX
IFTX
RESIF3RX
(X701)
(X702)
(X703)
NETCLK2
NETCLK1
110.8M3
(X705)
(X106)
(X108)
(X109)
(X110)
110,8M1
110,8M3
NETCLK1
NETCLK2
(X103)
REFIN
RFOUT
(X104)
A10
REFERENCE BOARD
1100.2600.02
(X102)
RESFREQ
(X105)
(W40)
A11/X119
AUDIO
Bl.3 / Sh. 3
RF4 IN
13dBm max
RF2
2W max
RF1
50W max
RF3 OUT
13dBm
(X4)
(X2)
(X1)
(X3)
A3
RX/TX BOARD
1100.1404.02
TX1
RX1
W14
W13
RFTX1
RFRX1
(X14)
(X13)
(X34)
(X33)
(A301)
TR–CORRECTION MODULE
1100.1604.02
IF3TX1
IF3RX1
W17
W19
(X37)
(X39)
(X708)
(X706)
A7
DIGITAL BOARD
1100.1804.02
(A760)
AUC MODULE
1100.2500.02
(A750)
TX DSP MODULE
1100.2100.03
(A720)
ADC MODULE
1100.2200.02
(A710)
DDC MODULE
1100.2300.03
(A205)
OCXO REF. OSZ.
CMU– B11
1100.5000.02
oder/or
OCXO REF. OSZ.
CMU– B11
1100.5100.02
(Opt.)
(X212)
(X101)
A–D
(X31)
(X71)
(X72)
(X73)
(X74)
(X75)
A20
FRONTEND
1100.3042.02
(X215)
W215
34
A200
MOTHERBOARD 1
1100.0920.02
(X223)
(X224)
W223
W224
50
(X213)
(X214)
A201
MOTHERBOARD 2
1100.0937.02
(X41)
TX2
RX2
(W24)
(W23)
RFTX2
IFRX2
(X24)
(X23)
IF3TX2
IF3RX2
(W27)
(W29)
(X709)
(X707)
(A780)
(A740)
(A730)
(A4)
RX/TX BOARD
1100.1404.02
RF RX/TX
AUX1
AUX2
110,8M2
IFRX
IFTX
RESIF3RX
AUDIO_NETCLK
(X704)
(W34)
(X107)
(W22)
(W21)
(W25)
(W26)
(W28)
CMU– B15
OPT.
2. HF– Kanal / 2. RF– Chanal
CMU– B91 1100.5800.02
(OPT.)
FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR
STROMLAUF GILT FUER VAR 02
CIRCUIT DIAGRAM IS VALID FOR MOD 02

| | | |



FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

STROMLAUF GILT FUER VAR 02

CIRCUIT DIAGRAM IS VALID FOR MOD 02

ROHDE&SCHWARZ

Aend Zust.	Aenderungsmitteilung	Datum	Name	Aend Zust.	Aenderungsmitteilung	Datum	Name	Norm
04.00		26.11.99	BT					

CMK	Datum	Name
Bearb		BT
Gepr		BT
TOP/TOP.3		
PLOTT 99-11-30 BERNDT	ZU GERAET CMU	

Benennung: CMU200 UNIV. RADIOCOM. TESTER

Zeichn.-Nr: 1100.0008 S

BLATT-NR: 3 #3

REG I V 1100.0008 | ERSTE Z 1100.0008

SHEET 2

X10, X11, X12 — FRONT MODULE CONTROLLER

SHEET 3

X21, X22 — E1–T1/ DUT–SUPPLY BOARD

SHEET 4

X31 — RX/TX BOARD 1

X41 — RX/TX BOARD 2

SHEET 5

X51, X52 — A/B TEST / IQ–MODDEMOD /LOW FREQ BOARD

SHEET 6

X61, X62, X63 — UNIVERSAL SIGN. UNIT 2

SHEET 7+8

X71, X72, X73, X74, X75 — DIGITAL BOARD

SHEET 9

X81, X82, X83 — UNIVERSAL SIGN. UNIT 1

SHEET 10

X91, X92 — USU1 CO–PROCESSOR

SHEET 11

X93 — USU1 CO–PROCESSOR

ISA–TERMINATION

SHEET 12

X216, X217, X222 — PC CARD

BUFFERS

SHEET 13

X219 — FRONT PANEL BOARD

X212 — OCXO BOARD

X218 — FLOPPY

X215 — FRONTEND BOARD

SHEET 14

X205, X206 — REAR PANEL BOARD 1

X207, X208 — REAR PANEL BOARD 2

SHEET 15

X200 — ABISSYM 1/2

X209, X210, X211, X220, X225 — FAN

X201, X202 — ABISASYM2

X203, X204 — ABISASYM1

X110 — POWER SUPPLY

SHEET 16

X223, X224 — MOTHERBOARD 1 1/2 CONNECTOR

X213, X214 — MOTHERBOARD 2 1/2 CONNECTOR

X221 — +5VREF

SHEET 17

MOTHERBOARD 2

X101 — REFERENZ BOARD

X111 — AUDIO BOARD

SHEET 18

REAR PANEL BOARD 1

X253 — LPT

X255 — IEC 625 / IEEE 488

X250 — MONITOR

X252 — COM 1

X251 — COM 2

X254 — KEYBOARD

SHEET 19

FRONT PANEL BOARD

X303 — AUX 3

X304 — SPEECH

X301 — DATA 1

X302 — DATA 2

SHEET 20

REAR PANEL BOARD 2

X451 — SERVICE

X450 — AUX

X452 — AUX 4

X453 — I/Q 1

X454 — I/Q 2

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

Bindende Angaben ueber Varianten Trimmwerte Bauteile und nicht bestueckte Bauteile siehe SA

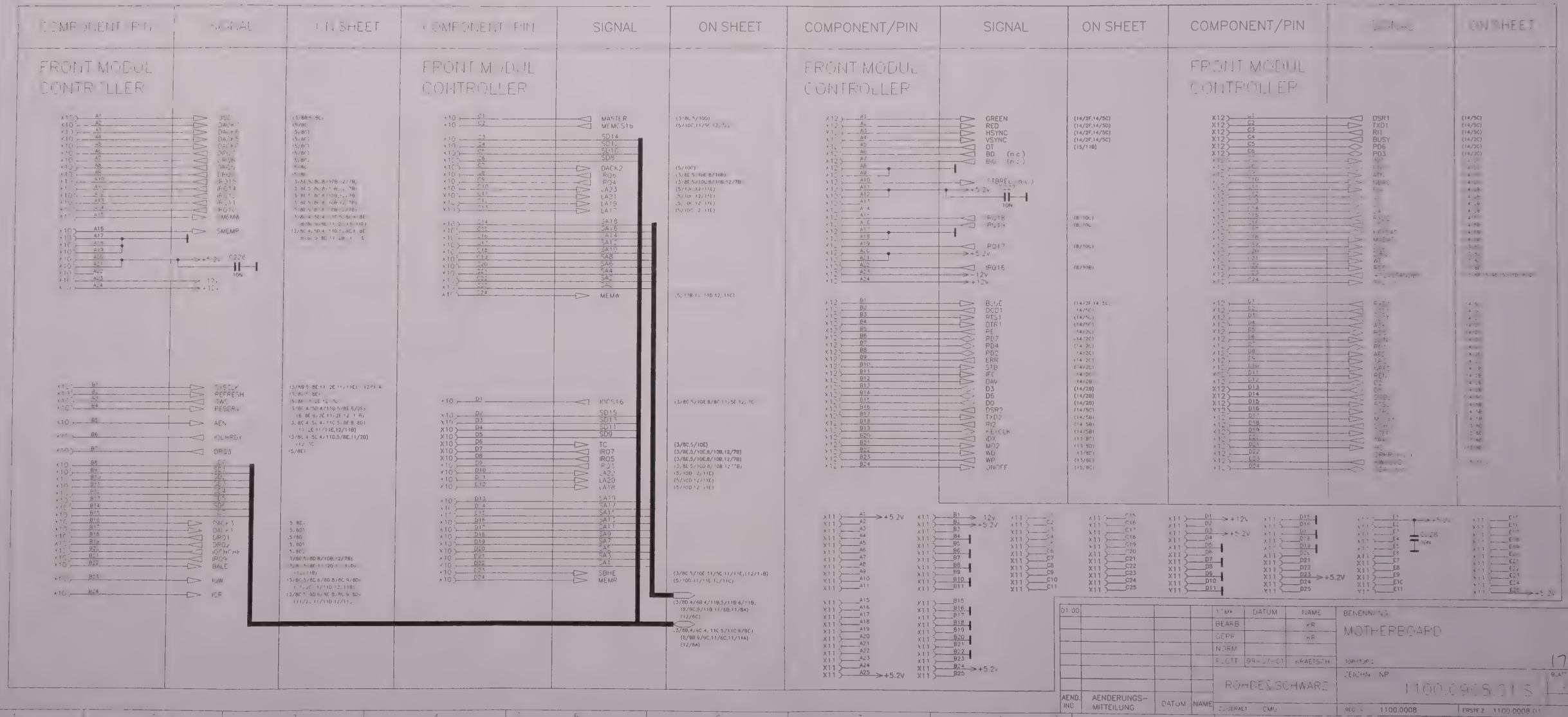
FOR BINDING INFORMATION ON MODELS TRIMMING AND COMPONENTS NOT FITTED SEE PARTS LIST

ACHTUNG ESD ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG

ATTENTION ESD ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

01.00				1CMK	DATUM	NAME	BENENNUNG		
				BEARB.		KR	MOTHERBOARD		
				GEPR.		KR			
				NORM					
				PLOTT	99-07-01	KRAETSCH	TOP TOP 1		16
				ROHDE&SCHWARZ			ZEICHN. NR		BLATT-NR
							1100.0918.01 S		1
AEND IND	AENDERUNGS-MITTEILUNG	DATUM	NAME	ZUGERAET CMU			REG.Nr. 1100.0008	ERSATZ 1100.0008.01	

CONNECTOR DEFINITIONS MB1



01.00				NAME	BENENNUNG: MOTHERBOARD
			BEARB		
			GEPR		
			NORM		
			FUNKT	99-07-01 KRAETSCH	TOP/STOP:
AEND. IND	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ	ZEICHN. NR: 1100.0905.01 5
				ZUSTAND CMU	REG.: 1100.0008 ERSTELL: 1100.0008.01

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CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
E1–T1/ DUT–SUPPLY BOARD		
A1	+5VREF	(4/2B.4/8B.5/2B.6/2B.7/2B) (9/2B.10/8B.13/11B.16/2B)
A2	+12V	
A3	+5VREF	
A4	+12V	
A5		
A6	+12V	
A7		
A8		
A9		
A10		
A11	+12V	
A12		
A13	LH1SIGINT	(7/50,9/10E)
A14	LH2SIGINT	(6/10E.7/5D)
A15		
A16		
A17		
A18	RXTX1TXSET	(4/2D.7/5B)
A19	RXTX1RXSET	(4/2D.7/5B)
A20	RXTX2TXSET	(4/8D.7/5C)
A21		
A22	RXTX2RXSET	(4/8D.7/5C)
A23	DEMODIN	(16/2C)
A24		
A25	LH1AFGENMON	(9/2D.16/2D)
A26	LH2AFGENMON	(6/2D.16/2C)
A27		
A28	AUXI2CSDA	(5/2C.7/2D.10/8C.14/11C)
A29	AUXI2CSCL	(5/2C.7/2D.10/8C.14/11C)
A30		
A31		
A32		
B1		
B2	DIAGNOSE	(5/2D.6/10C.7/2C.9/10C.10/8C) (13/11C.16/2C)
B3		
B4		
B5		
B6	ABISRX1	(15/5C)
B7		
B8	ABISTX1	(15/5C)
B9		
B10	ABISRX1SYMA	(15/3B)
B11	ABISRX1SYMB	(15/3B)
B12	ABISTX1SYMA	(15/3B)
B13	ABISTX1SYMB	(15/3B)
B14		
B15		
B16		
B17		
B18		
B19		
B20		
B21		
B22		
B23		
B24		
B25		
B26	PROGNETCLK	(3/5C.7/2C)
B27		
B28		
B29		
B30		
B31	ABISSYNCOUT	(16/3C)
B32		

COMPONENT/PIN	SIGNAL	ON SHEET
E1–T1/ DUT–SUPPLY BOARD		
X21 C21		
X21 C22		
X21 C23		
X21 C24		
X21 C25		
X21 C26		
X21 C27		
X21 C28		
X21 C29		
X21 C30		
X21 C31		
X21 C32	PROGNETCLK	(3/2E.7/2C)

COMPONENT/PIN	SIGNAL	ON SHEET
E1–T1/ DUT–SUPPLY BOARD		
X22 A1		
X22 A2		(2/20.5/8E.11/2E.11/11E) (12/11A)
X22 A3		(2/2B.5/8C)
X21 A4	SE0	(2/8E.4/6C.4/11C.5/11C.6/9C) (8/9B.9/9C.11/8C.11/11A) (12/8A)
X21 A5	SA1	
X21 A6	SE2	
X21 A7	SA3	
X21 A8	SA4	
X21 A9	SA5	
X21 A10	SA6	
X21 A11	SA7	
X21 A12	SA8	
X21 A13	SA9	
X21 A14	SA10	
X21 A15	SA11	
X21 A16	SA12	
X21 A17	SA13	
X21 A18	SA14	
X21 A19	SA15	
X21 A20	XDATREF	(2/20.4/50.4/11D.5/8E.11/2D)(12/7C)
X21 A21	AEN	(2/20.4/5C.4/11C.5/8E.8/8D) (11/2E.11/11E.12/11B)
X21 A22	RESDRV	(2/20.4/50.4/11D.5/8C.6/2E) (8/8C.9/2E.11/2E.12/11B)
X21 A23	IOW	(2/2E.5/8D.6/8D.8/8C.9/8D) (11/2C.11/11D.12/11B)
X21 A24	IOR	(2/2E.5/8D.6/8D.8/8C.9/8D) (11/2C.11/11D.12/11C)
X21 A25	SMEMR	(2/2C.4/50.4/11D.5/8C.6/8E) (8/8C.9/8D.11/2B.11/11E)
X21 A26	SMEMW	(2/2C.4/50.4/11D.5/8C.6/8E) (8/8C.9/8E.11/2C.11/11E)
X21 A27	BALE	(2/2E.5/8D.11/2D.11/11D) (12/11B)
X21 A28	IOCS16	(2/50.5/10E.8/8C.11/5E.12/7C)
X21 A29	T	(2/50.5/10E)
X21 A30	SBHE	(2/5E.5/10D.11/5C.11/11E)(12/11B)
X22 A31	REFRESH	(2/20.5/8E)
X21 A32	MASTER	(2/5B.5/10D)
X21 B1	SA0	(2/8E.4/8B.4/11B.5/11B.6/11B) (8/9C.9/11B.11/6B.11/8A) (12/6C)
X21 B2	SA1	
X21 B3	SA2	
X21 B4	SA3	
X21 B5	SA4	
X21 B6	SA5	
X21 B7	SA6	
X21 B8	SA7	
X21 B9	SA8	
X21 B10	SA9	
X21 B11	SA10	
X21 B12	SA11	
X21 B13	SA12	
X21 B14	SA13	
X21 B15	SA14	
X21 B16	SA15	
X21 B17	SA16	
X21 B18	SA17	
X21 B19	SA18	
X21 B20	SA19	
X21 B21		
X21 B22	IRQ3	(2/50.5/10D.8/10B.12/7B)
X21 B23	IRQ4	(2/5B.5/10C.8/10B.12/7B)
X21 B24	IRQ5	(2/50.5/10E.8/10B.12/7B)
X21 B25	IRQ6	(2/5B.5/10C.8/10B)
X21 B26	IRQ7	(2/50.5/10E.8/10B.12/7B)
X22 B27	IRQ9	(2/2E.5/8D.8/10B.12/7B)
X21 B28	IRQ10	(2/2C.5/8C.8/10B.12/7B)
X21 B29	IRQ11	(2/2C.5/8C.8/10B.12/7B)
X21 B30	IRQ12	(2/2B.5/8C.8/10B.12/7B)
X21 B31	IRQ14	(2/2B.5/8C.8/10B.12/7B)
X21 B32	IRQ15	(2/2B.5/8C.8/10B.12/7B)

COMPONENT/PIN	SIGNAL	ON SHEET
E1–T1/ DUT–SUPPLY BOARD		
X2 C1		
X2 C2		
X2 C3		
X2 C4		
X2 C5		
X2 C6		
X2 C7		
X2 C8		
X2 C9		
X2 C10		
X2 C11		
X2 C12		
X2 C13		
X2 C14		
X2 C15		
X2 C16		
X2 C17		
X2 C18		
X2 C19		
X2 C20		
X2 C21		
X2 C22		
X2 C23		
X2 C24		
X2 C25		
X2 C26		
X2 C27		
X2 C28		
X2 C29		
X2 C30		
X2 C31		
X2 C32		

AEND IND	AENDERUNGS-MITTEILUNG	DATUM	NAME
01 00			

	DATUM	NAME
KONSTR		KR
BEARB		KR
GEPR		KR
NORM		
PLOTT	99-07-01	KRAETSCH

ROHDE&SCHWARZ

BENENNUNG: MOTHERBOARD

TOP TOP 3

ZEICHN.-NR: 1100.0908.01 S

BLATT-NR: 3 +

ZUGERAET: SMU

REG.-NR: 1100.0008

ERSTE Z: 1100.0008.01

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FÜR DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
RX/TX BOARD 1		
X31 A1	+5VREF	(3/28,4/88,5/28,6/28,7/28) (9/28,10/88,13/11B,16/28)
X31 A2		
X31 A3		
X31 A4	-12V	
X31 A5		
X31 A6	+5.2V C47 10N	
X31 A7		
X31 A8		
X31 A9	+8V	
X31 A10		
X31 A11	+12V	
X31 A12		
X31 A13	+28V	
X31 A14		
X31 A15		
X31 A16		
X31 A17	+8V	
X31 A18	FERXAMP1	(13/11C)
X31 A19		
X31 A20	30DBATT1	(13/11C)
X31 A21	RXTX1DCFRAME	(7/8D)
X31 A22	RXTX1RES1	(5/20,7/8D,10/8D)
X31 A23	RXTX1RES2	(5/20,10/8D)
X31 A24	RXTX1RES3	(5/20,10/8D)
X31 B1		
X31 B2		
X31 B3		
X31 B4	-12V	
X31 B5		
X31 B6	+6V	
X31 B7		
X31 B8		
X31 B9	+8V	
X31 B10		
X31 B11	+12V	
X31 B12		
X31 B13	RXTX1CLK	(7/5B)
X31 B14	RXTX1DCDATA	(7/5B)
X31 B15	RXTX1TXSET	(3/2C,7/5B)
X31 B16		
X31 B17	RXTX1RXSET	(3/2C,7/5B)
X31 B18	RXTX1RXSETACK	(7/5B)
X31 B19	RXTX1TXSETACK	(7/5B)
X31 B20		
X31 B21	RXTX1STEPCLK	(7/5B)
X31 B22	RXTX1CDFRAME	(7/5B)
X31 B23	RXTX1CDDATA	(7/5B)
X31 B24		

COMPONENT/PIN	SIGNAL	ON SHEET
RX/TX BOARD 1		
X31 C1		
X31 C2	ADRC0D1	
X31 C3	ADRC0D2	
X31 C4	SA0	(2/6E,3/8D,4/11B,5/11B,6/11B) (8/9C,9/11B,11/8B,11/8A) (12/9C)
X31 C5	SA1	
X31 C6	SA2	
X31 C7	SA3	
X31 C8	SA4	
X31 C9	SA5	
X31 C10	SA6	
X31 C11	SA7	
X31 C12	SA8	
X31 C13	SA9	
X31 C14	SA10	
X31 C15	SA11	
X31 C16	SA12	
X31 C17	SA13	
X31 C18	SA14	
X31 C19	SA15	
X31 C20	SA16	
X31 C21	SA17	
X31 C22	SA18	
X31 C23	SA19	
X31 C24	AEN	(2/2D,3/8C,4/11C,5/8E,8/8D) (11/2E,11/11E,12/11B)
X31 D1	SD0	(2/6F,3/8B,4/11C,5/11C,6/9C) (8/9B,9/9C,11/6C,11/11A) (12/6A)
X31 D2	SD1	
X31 D3	SD2	
X31 D4	SD3	
X31 D5	SD4	
X31 D6	SD5	
X31 D7	SD6	
X31 D8	SD7	
X31 D9		
X31 D10		
X31 D11	SMEMR	(2/2C,3/8C,4/11D,5/8C,6/8E) (8/8C,9/8D,11/2B,11/11E)
X31 D12	SMEMW	(2/2C,3/8C,4/11D,5/8C,6/8E) (8/8C,9/8E,11/2C,11/11E)
X31 D13	RESDRV	(2/2D,3/8C,4/11D,5/8E,6/2E) (8/8E,9/2E,11/2E,12/11B)
X31 D14	IOCHRDY	(2/2D,3/8C,4/11D,5/8E,11/2D) (12/7C)
X31 D15		
X31 D16		
X31 D17	RXTX1KUPIRQ	(7/5C)
X31 D18	RxTx1KUPRESET	(7/5C)
X31 D19	RXTX1POWREGSTRB	(7/5C)
X31 D20	RXTX1SCIRXD	(14/11B)
X31 D21	RXTX1SCITXD	(14/11B)
X31 D22	RXTX1POWERINT	(8/10C)
X31 D23	RxTx1NCORX	(7/5E)
X31 D24	RXTX1NCOTX	(7/5E)

COMPONENT/PIN	SIGNAL	ON SHEET
RX/TX BOARD 2		
X41 A1		
X41 A2	+5VREF	(3/28,4/28,5/28,6/28,7/28) (9/28,10/88,13/11B,16/28)
X41 A3		
X41 A4	-12V	
X41 A5		
X41 A6	+5.2V C199 10N	
X41 A7		
X41 A8		
X41 A9	+8V	
X41 A10		
X41 A11	+12V	
X41 A12		
X41 A13	+28V	
X41 A14		
X41 A15		
X41 A16		
X41 A17	+8V	
X41 A18	FERXAMP2	(13/11C)
X41 A19		
X41 A20	30DBATT2	(13/11C)
X41 A21	RXTX2DCFRAME	(7/10D)
X41 A22	RXTX2RES1	(5/20,7/10D,10/8D)
X41 A23	RXTX2RES2	(5/20,10/8D)
X41 A24	RXTX2RES3	(5/20,10/8D)
X41 B1		
X41 B2		
X41 B3		
X41 B4	-12V	
X41 B5		
X41 B6	+6V	
X41 B7		
X41 B8		
X41 B9	+8V	
X41 B10		
X41 B11	+12V	
X41 B12		
X41 B13	RXTX2CLK	(7/5C)
X41 B14	RXTX2DCDATA	(7/5C)
X41 B15	RXTX2TXSET	(3/2C,7/5C)
X41 B16		
X41 B17	RXTX2RXSET	(3/2C,7/5C)
X41 B18	RXTX2RXSETACK	(7/5C)
X41 B19	RXTX2TXSETACK	(7/5C)
X41 B20		
X41 B21	RXTX2STEPCLK	(7/5C)
X41 B22	RXTX2CDFRAME	(7/5C)
X41 B23	RXTX2CDDATA	(7/5C)
X41 B24		

FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
A/B TEST / IQ-MODDEMOD / LOW FREQ BOARD		
X51 A1	+5VREF	(3,2B,4/2B,4/8B,6/2B,7,2B+ (9/2B,10/8B,11/11B,16/2B,
X51 A4	+12V	
X51 A5	+5.2V C200 10N	
X51 A7		
X51 A9	+8V	
X51 A10	+12V	
X51 A13	+8V	
X51 A18	+3.3V C201 10N	
X51 A20		
X51 A21		
X51 A22	AUX12CSDA	(3/2C,7/2D,10/8C,14/11C)
X51 A23	AUX12CSCL	(3/2C,7/2D,10/8C,14/11C)
X51 A24		
X51 B1		
X51 B2 RESD 100	DIAGNOSE	(3/2D,6/10C,7,2C,9/10C,10/8C) (13,15L,16/2D)
X51 B4	-12V	
X51 B6	+5.2V	
X51 B8		
X51 B9	+8V	
X51 B11	+12V	
X51 B12		
X51 B13	RXTX1RES1	(4/2C,7/8D,10/8D)
X51 B14	RXTX1RES2	(4/2C,10/8D)
X51 B15	RXTX1RES3	(4/2C,10/8D)
X51 B16	RXTX2RES1	(4/8C,7/10D,10/8D)
X51 B17	RXTX2RES2	(4/8C,10/8D)
X51 B18	RXTX2RES3	(4/8C,10/8D)
X51 B19		
X51 B20		
X51 B21		
X51 B22		
X51 B23		
X51 B24		

COMPONENT/PIN	SIGNAL	ON SHEET
A/B TEST / IQ-MODDEMOD / LOW FREQ BOARD		
X51 C1		
X51 C2	EXT1MODIIN	(14,8B
X51 C3	EXT1MODQIN	(14/8B)
X51 C4		
X51 C5	EXT1MODIOUT	(14/8B)
X51 C6	EXT1MODQOUT	(14/8B)
X51 C7		
X51 C8	EXT1DEMODIIN	(14/8B)
X51 C9	EXT1DEMODQIN	(14/8B)
X51 C10		
X51 C11	EXT1DEMODIOUT	(14/8B)
X51 C12	EXT1DEMODQOUT	(14/8B)
X51 C13		
X51 C14	EXT2MODIIN	(14/8C)
X51 C15	EXT2MODQIN	(14/8C)
X51 C16		
X51 C17	EXT2MODIOUT	(14,8C,
X51 C18	EXT2MODQOUT	(14,8C,
X51 C19		
X51 C20	EXT2DEMODIIN	(14/8C)
X51 C21	EXT2DEMODQIN	(14/8C)
X51 C22		
X51 C23	EXT2DEMODIOUT	(14/8C)
X51 C24	EXT2DEMODQOUT	(14/8C)
X51 D1		
X51 D2	IMODFILAUC1	(5/10C)
X51 D3	QMODFILAUC1	(8/10C)
X51 D4		
X51 D5	IMODTOAUC1	(8/10C)
X51 D6	QMODTOAUC1	(8/10C)
X51 D7		
X51 D8	IMODFILAUC2	(8/10D)
X51 D9	QMODFILAUC2	(8/10D)
X51 D10		
X51 D11	IMODTOAUC2	(8/10D)
X51 D12	QMODTOAUC2	(8/10D)
X51 D13		
X51 D14		
X51 D15		
X51 D16		
X51 D17		
X51 D18		
X51 D19		
X51 D20		
X51 D21		
X51 D22		
X51 D23		
X51 D24		

COMPONENT/PIN	SIGNAL	ON SHEET
A/B TEST / IQ-MODDEMOD / LOW FREQ BOARD		
X52 A1	+12V	
X52 A2	+12V	
X52 A3		
X52 A4	+5.2V C202 10N	
X52 A5		
X52 A6		
X52 A7		
X52 A8		
X52 A9	SMEMR	(2/2C,3/8C,4/50,4/11D,6/8E) (8/8C,9/8D,11/2B,11/11C)
X52 A10	SMEMW	(2/2C,3/8C,4/50,4/11D,6/8E)
X52 A11	IRQ10	(2/2B,3/8E,8/10B,12/7B)
X52 A12	IRQ11	(2/2B,3/8E,8/10B,12/7B)
X52 A13	IRQ12	(2/2B,3/8E,8/10B,12/7B)
X52 A14	IRQ14	(2/2B,3/8E,8/10B,12/7B)
X52 A15	IRQ15	(2/2B,3/8E,8/10B,12/7B)
X52 A16	DRQ0	(2/2B)
X52 A17	DRQ5	(2/2B)
X52 A18	DRQ6	(2/2B)
X52 A19	DRQ7	(2/2B)
X52 A20	DACK0	(2/2B)
X52 A21	DACK5	(2/2B)
X52 A22	DACK6	(2/2B)
X52 A23	DACK7	(2/2B)
X52 A24	OSC	(2/2D,3/8B)
X52 B1	IOR	(2/2E,3/8C,4/8D,8/8C,9/8D, 11/2D,11/11B,12/11B)
X52 B2	IOW	(2/2E,3/8C,5/8D,8/8C,9/8D, 11/2D,11/11B,12/11B)
X52 B3	BALE	(2/2E,3/8C,11/2D,11/11C,12/11B)
X52 B4	IRQ9	(2/2E,3/8E,8/10B,12/7B)
X52 B5	IOCHCHK	(2/2E)
X52 B6	DRQ2	(2/2E)
X52 B7	DRQ1	(2/2E)
X52 B8	DACK1	(2/2E)
X52 B9	DACK3	(2/2E)
X52 B10	SD0	
X52 B11	SD1	
X52 B12	SD2	
X52 B13	SD3	
X52 B14	SD4	
X52 B15	SD5	
X52 B16	SD6	
X52 B17	SD7	
X52 B18	DRQ3	(2/2D)
X52 B19	IOCHRDY	(2/2D,3/8C,4/50,4/11D,11/2D) (12/7C)
X52 B20	AEN	(2/2D,3/8C,4/5C,4/11C,8/8D) (11/2E,11/11E,12/11B)
X52 B21	RESDRV	(2/2D,3/8C,4/50,4/11D,6/2E) (8/8E,9/2E,11/2E,12/11B)
X52 B22	OWS	(2/2D,11/2E,12/7C)
X52 B23	REFRESH	(2/2D,3/8C)
X52 B24	SYSCLK	(2/2D,3/8B,11/2E,11/11E) (12/11A

COMPONENT/PIN	SIGNAL	ON SHEET
A/B TEST / IQ-MODDEMOD / LOW FREQ BOARD		
X52 C1	MEMW	(2/3C,11/11D,12/11C)
X52 C2		
X52 C3		
X52 C4		
X52 C5		
X52 C6		
X52 C7		
X52 C8		
X52 C9		
X52 C10		
X52 C11		
X52 C12		
X52 C13		
X52 C14		
X52 C15		
X52 C16		
X52 C17		
X52 C18		
X52 C19		
X52 C20		
X52 C21		
X52 C22		
X52 C23		
X52 C24		
X52 D1		
X52 D2		
X52 D3		
X52 D4		
X52 D5		
X52 D6		
X52 D7		
X52 D8		
X52 D9		
X52 D10		
X52 D11		
X52 D12		
X52 D13		
X52 D14		
X52 D15		
X52 D16		
X52 D17		
X52 D18		
X52 D19		
X52 D20		
X52 D21		
X52 D22		
X52 D23		
X52 D24		

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

01.00				ICMK	DATUM	NAME	BENENNUNG
				BEARB.		KR	MOTHERBOARD
				GEPR.		KR	
				NORM			
				P_OTT	94-07-01	KPAETSCH	TOP/TOP 5
				ROHDE&SCHWARZ			ZEICHN.-NR 1100.0908.01
AEND IND	AENDERUNGS-MITTEILUNG	DATUM	NAME				BLATT-NR 20
				GERAET ZML			REG.-Nr 1100.0008 ERSETZT 1100.0008.01

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 2		
X61 A1	+5VREF	(3/2B,4/2B,4/8B,5/2B,7/2B) (9/2B,10/8B,13/11B,16/2B)
X61 A2		
X61 A3		
X61 A4	-12V	
X61 A5		
X61 A6	+5.2V C214 10N	
X61 A7		
X61 A8	+8V	
X61 A9		
X61 A10		
X61 A11	+12V	
X61 A12	LH2MIDO	(8/5B)
X61 A13	LH2MODO	(8/5C)
X61 A14		
X61 A15	LH2SERCLK	(7/10C)
X61 A16	LH2SERLDDATA	(7/10C)
X61 A17	LH2SERLDFRAME	(7/10C)
X61 A18	LH2SERLDATA	(7/10C)
X61 A19	LH2PRISYNTHENRES (n.c.)	
X61 A20	LH2SERDLFRAME	(7/10D)
X61 A21	LH2PRITXI	(7/10D)
X61 A22	LH2PRITXQ	(7/10D)
X61 A23	LH2PRITXQGND	(7/10D)
X61 A24	LH2TXSET	(7/10D)
X61 A25	LH2RXSET	(7/10D)
X61 A26 R258 220	LH2POWREGSTRB	(7/10D,10/10D)
X61 A27	LH2RSVD1	(7/10D)
X61 A28	LH2SECSYNTHENRES (n.c.)	
X61 A29	LH2RSVD2	(7/10D)
X61 A30	LH2SECTXI	(7/10D)
X61 A31	LH2SECTXQ	(7/10D)
X61 A32	LH2SECTXIQGND	(7/10D)
X61 B1	LH2LEVCLK (n.c.)	
X61 B2	LH2LEVDATA (n.c.)	
X61 B3	+3.3V C215 10N	
X61 B4		
X61 B5		
X61 B6	+5.2V	
X61 B7		
X61 B8		
X61 B9	LH2AFGENMON	(3/2C,16/2C)
X61 B10	LH2HANDSETIN	(13/3E,16/2D)
X61 B11	LH2HANDSETOUT	(13/3E,16/2D)
X61 B12		
X61 B13	LH2TBUS6	(8/5D)
X61 B14	LH2TBUS7	(8/5D)
X61 B15		
X61 B16		
X61 B17		
X61 B18		
X61 B19		
X61 B20		
X61 B21	LH2RES1	(16/5C)
X61 B22		
X61 B23	RESDRV	(2/20,3/8C,4/5D,4/110,5/8C) (8/8E,9/2E,11/2E,12/11B)
X61 B24		
X61 B25	LH2DEMSERDAT1	(8/5D)
X61 B26	LH2DEMSERDAT2	(8/5D)
X61 B27	LH2DEMSERCLK	(8/5D)
X61 B28	LH2DEMSERSTRB	(8/5D)
X61 B29	LH2XSPTXRDY	(16/5C)
X61 B30	LH2BSPBFI	(16/5C)
X61 B31	LH2XSPSP	(16/5C)
X61 B32	LH2BSPTXSFM	(16/5C)
	LH2PRISPTAF	(16/5C)

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 2		
X61 C1	LH2GND	(13/3F)
X61 C2	LH2RxA	(13/3F)
X61 C3	LH2DTRA	(13/3F)
X61 C4	LH2CTSA	(13/3F)
X61 C5	LH2TXDA	(13/3F)
X61 C6	LH2RTSA	(13/3F)
X61 C7	LH2RXDA	(13/3F)
X61 C8	LH2DSRA	(13/3F)
X61 C9	LH2DCDA	(13/3E)
X61 C10	LH2SERVGND	(13/3F)
X61 C11	LH2TBUS8	(8/5D)
X61 C12		
X61 C13	LH2DID4	(7/10B)
X61 C14	LH2DID5	(7/10B)
X61 C15	LH2DID6	(7/10B)
X61 C16	LH2DID7	(7/10B)
X61 C17	LH2DID8	(7/10B)
X61 C18	LH2DID9	(7/10B)
X61 C19	LH2DID10	(7/10B)
X61 C20	LH2DID11	(7/10B)
X61 C21		
X61 C22	LH2DOD4	(7/10C)
X61 C23	LH2DOD5	(7/10C)
X61 C24	LH2DOD6	(7/10C)
X61 C25	LH2DOD7	(7/10C)
X61 C26	LH2DOD8	(7/10C)
X61 C27	LH2DOD9	(7/10C)
X61 C28	LH2DOD10	(7/10C)
X61 C29	LH2DOD11	(7/10C)
X61 C30	LH2DIOCLK	(7/2C)
X61 C31		
X61 C32	LH2NETCLK	(7/2C)
X62 A1	+3.3V	
X62 A2		
X62 A3		
X62 A4		
X62 A5		
X62 A6 R233 0 M	(LH2ID0)	
X62 A7 R234 0	(LH2ID1)	
X62 A8		
X62 A9		
X62 A10		
X62 A11		
X62 A12		
X62 B1		
X62 B2		
X62 B3		
X62 B4		
X62 B5		
X62 B6		
X62 B7		
X62 B8		
X62 B9		
X62 B10		
X62 B11		
X62 B12		

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 2		
X62 C1	LH1LH2CON1	(9/8B)
X62 C2	LH1LH2CON2	(9/8B)
X62 C3	LH1LH2CON3	(9/8B)
X62 C4	LH1LH2CON4	(9/8B)
X62 C5	LH1LH2CON5	(9/8B)
X62 C6	LH1LH2CON6	(9/8B)
X62 C7	LH1LH2CON7	(9/8B)
X62 C8	LH1LH2CON8	(9/8B)
X62 C9	LH1LH2CON9	(9/8B)
X62 C10	LH1LH2CON10	(9/8B)
X62 C11	LH1LH2CON11	(9/8B)
X62 C12	LH1LH2CON12	(9/8B)
X62 D1	LH2LH1CON1	(9/8B)
X62 D2	LH2LH1CON2	(9/8C)
X62 D3	LH2LH1CON3	(9/8C)
X62 D4	LH2LH1CON4	(9/8C)
X62 D5	LH2LH1CON5	(9/8C)
X62 D6	LH2LH1CON6	(9/8C)
X62 D7	LH2LH1CON7	(9/8C)
X62 D8	LH2LH1CON8	(9/8C)
X62 D9	LH2LH1CON9	(9/8C)
X62 D10	LH2LH1CON10	(9/8C)
X62 D11	LH2LH1CON11	(9/8C)
X62 D12	LH2LH1CON12	(9/8C)
X63 A1	SD0	(2/6E,3/8B,4/6C,4/11C,5/11C) (8/8B,9/8C,11/5C,11/11A) (12/6A)
X63 A2	SD1	
X63 A3	SD2	
X63 A4	SD3	
X63 A5	SD4	
X63 A6	SD5	
X63 A7	SD6	
X63 A8	SD7	
X63 A9	LH2DID3	(7/10B)
X63 A10	LH2DID2	(7/10B)
X63 A11	LH2DID1	(7/10B)
X63 A12	LH2DID0	(7/10B)
X63 A13	LH2DOD3	(7/10C)
X63 A14	LH2DOD2	(7/10C)
X63 A15	LH2DOD1	(7/10C)
X63 A16	LH2DOD0	(7/10C)
X63 A17		
X63 A18		
X63 A19		
X63 A20		
X63 A21	LH2MOD9	(8/5C)
X63 A22	LH2MOD8	(8/5C)
X63 A23	IOW	(2/2E,3/8C,5/8D,8/8C,9/8D) (11/2C,11/11D,12/11B)
X61 A24	IOR	(2/2E,3/8C,5/8D,8/8C,9/8D) (11/2C,11/11D,12/11C)
X63 A25	SMEMR	(2/2C,3/8C,4/50,4/11D,5/8C) (8/8C,9/8D,11/2B,11/11E)
X63 A26	SMEMW	(2/2C,3/8C,4/50,4/11D,5/8C) (8/8C,9/8E,11/2C,11/11E)
X63 A27		
X63 A28	LH2SCIEXTRXD	(8/50)
X63 A29	LH2SCIEXTTXD	(8/50)
X63 A30	LH2SCIEXTSCLK	(8/50)
X63 A31		
X63 A32	LH2NETCLKOUT (n.c.)	

C212 +3.3V 10N

C213 +5.2V 10N

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 2		
X63 B1	SA0	(2/6C,3/8D,4/6B,4/11B,5/11B) (8/8D,9/11B,11/5B,11/11B) (12/6C)
X63 B2	SA1	
X63 B3	SA2	
X63 B4	SA3	
X63 B5	SA4	
X63 B6	SA5	
X63 B7	SA6	
X63 B8	SA7	
X63 B9	SA8	
X63 B10	SA9	
X63 B11	SA10	
X63 B12	SA11	
X63 B13	LH2MIOCLK	
X63 B14	LH2MID11	
X63 B15	LH2MID10	
X63 B16	LH2MID9	
X63 B17	LH2MID8	
X63 B18	LH2MOD11	
X63 B19	LH2MOD10	
X63 B20		
X63 B21 R251 100	DIAGNOSE	(3/20,5/20,7/2C,9/10C,10/8C) (13/11C,16/2C)
X63 B22		
X63 B23	LH2SECEXTI (n.c.)	
X63 B24		
X63 B25	LH2SECEXTQ (n.c.)	
X63 B26	LH2PRIEXTRAMP (n.c.)	
X63 B27		
X63 B28		
X63 B29	LH2PRIEXTI (n.c.)	
X63 B30	LH2PRIEXTQ (n.c.)	
X63 B31		
X63 B32		
X63 C3	LH2MID1	
X63 C4	LH2MID2	
X63 C5	LH2MID3	
X63 C6	LH2MID4	
X63 C7	LH2MID5	
X63 C8	LH2MID6	
X63 C9	LH2MID7	
X63 C10		
X63 C11	LH2MOD7	
X63 C12	LH2MOD6	
X63 C13	LH2MOD5	
X63 C14	LH2MOD4	
X63 C15	LH2MOD3	
X63 C16	LH2MOD2	
X63 C17	LH2MOD1	
X63 C18	LH2MOD0	
X63 C19		
X63 C20	LH2BSPBFI	
X63 C21	LH2BSPTXSFM	
X63 C22	LH2BSPTXRDY	
X63 C23	LH2BSPRXSFM	
X63 C24	LH2BSPRXRDY	
X63 C25	PI WERNT	
X63 C26		
X63 C27	LH2CSDPRAM	
X63 C28	LH2CSLHCONTROL	
X63 C29	LH2DRVENABLE	
X63 C30	LH2DRVDIR	
X63 C31	LH2LHINT	
X63 C32		

01.10					ICMK	DATUM	NAME
					BEARB		KR
					GEPR		KR
					NORM		
					PLOTT	23-07-11	KRAETSCH
AEND IND	AENDERUNGS-MITTEILUNG	DATUM	NAME				

BENENNUNG: MOTHERBOARD

TOP MAP 6

21

ROHDE&SCHWARZ

ZU GERAET CMU

ZEICHN. NR 1100.0008.01 S

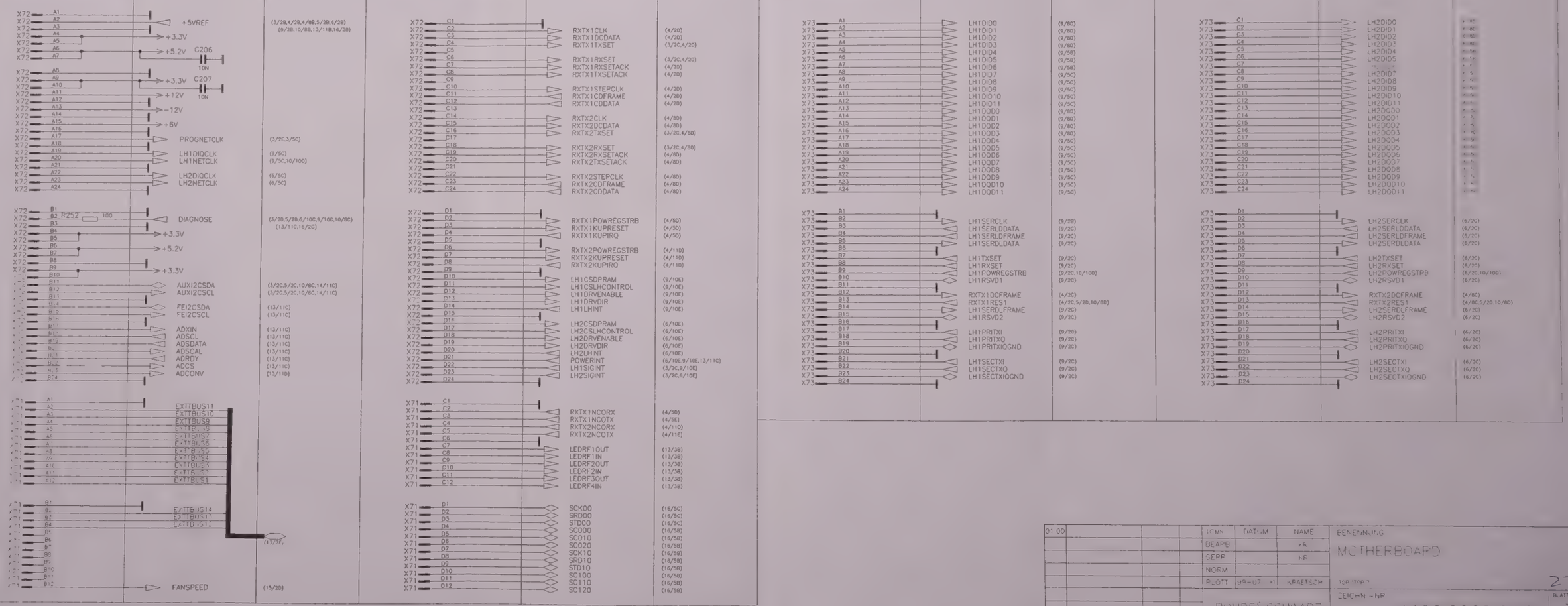
BLATT-NR

REGIE 1100.0008

ERSTELL 1100.0008.21

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

CONNECTOR DEFINITIONS MB1


COMPONENT/PIN
SIGNAL
ON SHEET
DIGITAL BOARD
X72 A1 A2 A3 A4 A5 A6 A7 +5VREF +3.3V +5.2V C206 10N
(3/2B,4/2B,4/8B,5/2B,6/2B) (9/2B,10/8B,13/11B,16/2B)
X72 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 +3.3V C207 10N +12V −12V +6V PROGNETCLK LH1DIQCLK LH1NETCLK LH2DIQCLK LH2NETCLK
(3/2C,3/5C) (9/5C) (9/5C,10/100) (6/5C) (6/5C)
X72 B1 B2 R252 100 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20 B21 B22 B23 B24 DIAGNOSE +3.3V +5.2V +3.3V AUXI2CSDA AUXI2CSCL FEI2CSDA FEI2CSCL ADXIN ADSCL ADSDATA ADSCAL ADRDY ADCS ADCONV
(3/20,5/2D,6/10C,9/10C,10/8C) (13/11C,16/2C)
(3/2C,5/2C,10/8C,14/11C) (3/2C,5/2C,10/8C,14/11C)
(13/11C) (13/11C)
(13/11C) (13/11C) (13/11C) (13/11C) (13/11C) (13/11D)
X71 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 EXTTBUS11 EXTTBUS10 EXTTBUS9 EXTTBUS8 EXTTBUS7 EXTTBUS6 EXTTBUS5 EXTTBUS4 EXTTBUS3 EXTTBUS2 EXTTBUS1
X71 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 EXTTBUS14 EXTTBUS13 EXTTBUS12 FANSPEED
(13/7F)
(15/20)
DIGITAL BOARD
X72 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 RXTX1CLK RXTX1DCDATA RXTX1TXSET RXTX1RXSET RXTX1RXSETACK RXTX1TXSETACK RXTX1STEPCLK RXTX1CDFRAME RXTX1CDDATA RXTX2CLK RXTX2DCDATA RXTX2TXSET RXTX2RXSET RXTX2RXSETACK RXTX2TXSETACK RXTX2STEPCLK RXTX2CDFRAME RXTX2CDDATA
(4/20) (4/20) (3/2C,4/20) (3/2C,4/20) (4/20) (4/20) (4/20) (4/20) (4/80) (4/80) (3/2C,4/80) (3/2C,4/80) (4/80) (4/80) (4/80) (4/80)
X72 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 RXTX1POWREGSTRB RXTX1KUPRESET RXTX1KUPIRQ RXTX2POWREGSTRB RXTX2KUPRESET RXTX2KUPIRQ LH1CSDPRAM LH1CSLHCONTROL LH1DRVENABLE LH1DRVDIR LH1LHINT LH2CSDPRAM LH2CSLHCONTROL LH2DRVENABLE LH2DRVDIR LH2LHINT POWERINT LH1SIGINT LH2SIGINT
(4/50) (4/50) (4/50) (4/110) (4/110) (4/110) (9/10E) (9/10E) (9/10E) (9/10E) (9/10E) (6/10E) (6/10E) (6/10E) (6/10E) (6/10E) (6/10E,8/10E,13/11C) (3/2C,9/10E) (3/2C,6/10E)
X71 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 RXTX1NCORX RXTX1NCOTX RXTX2NCORX RXTX2NCOTX LEDRF1OUT LEDRF1IN LEDRF2OUT LEDRF2IN LEDRF3OUT LEDRF4IN
(4/50) (4/5C) (4/110) (4/11C) (13/3B) (13/3B) (13/3B) (13/3B) (13/3B) (13/3B)
X71 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 SCK00 SRD00 STD00 SC000 SC010 SC020 SCK10 SRD10 STD10 SC100 SC110 SC120
(16/5C) (16/5C) (16/5C) (16/5B) (16/5B) (16/5B) (16/5B) (16/5B) (16/5B) (16/5B) (16/5B) (16/5B)
DIGITAL BOARD
X73 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 LH1DID0 LH1DID1 LH1DID2 LH1DID3 LH1DID4 LH1DID5 LH1DID6 LH1DID7 LH1DID8 LH1DID9 LH1DID10 LH1DID11 LH1DQD0 LH1DQD1 LH1DQD2 LH1DQD3 LH1DQD4 LH1DQD5 LH1DQD6 LH1DQD7 LH1DQD8 LH1DQD9 LH1DQD10 LH1DQD11
(9/80) (9/80) (9/80) (9/80) (9/58) (9/58) (9/5C) (9/5C) (9/5C) (9/5C) (9/5C) (9/80) (9/80) (9/80) (9/80) (9/5C) (9/5C) (9/5C) (9/5C) (9/5C) (9/5C) (9/5C) (9/5C)
X73 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20 B21 B22 B23 B24 LH1SERCLK LH1SERLDDATA LH1SERLDFRAME LH1SERDLDATA LH1TXSET LH1RXSET LH1POWREGSTRB LH1RSVD1 RXTX1DCFRAME RXTX1RES1 LH1SERDLFRAME LH1RSVD2 LH1PRITXI LH1PRITXQ LH1PRITXIQGND LH1SECTXI LH1SECTXQ LH1SECTXIQGND
(9/2B) (9/2C) (9/2C) (9/2C) (9/2C) (9/2C) (9/2C,10/100) (9/2C) (4/2C) (4/2C,5/2D,10/8D) (9/2C) (9/2C) (9/2C) (9/2C) (9/2C) (9/2C) (9/2C)
DIGITAL BOARD
X73 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 LH2DID0 LH2DID1 LH2DID2 LH2DID3 LH2DID4 LH2DID5 LH2DID6 LH2DID7 LH2DID8 LH2DID9 LH2DID10 LH2DID11 LH2DQD0 LH2DQD1 LH2DQD2 LH2DQD3 LH2DQD4 LH2DQD5 LH2DQD6 LH2DQD7 LH2DQD8 LH2DQD9 LH2DQD10 LH2DQD11
X73 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 LH2SERCLK LH2SERLDDATA LH2SERLDFRAME LH2SERDLDATA LH2TXSET LH2RXSET LH2POWREGSTRB LH2RSVD1 RXTX2DCFRAME RXTX2RES1 LH2SERDLFRAME LH2RSVD2 LH2PRITXI LH2PRITXQ LH2PRITXIQGND LH2SECTXI LH2SECTXQ LH2SECTXIQGND
(6/2C) (6/2C) (6/2C) (6/2C) (6/2C) (6/2C) (6/2C,10/100) (6/2C) (4/8C) (4/8C,5/2D,10/8D) (6/2C) (6/2C) (6/2C) (6/2C) (6/2C) (6/2C)
FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR
01 00
IDNR DATUM NAME
BEARB FR
GEPR HR
NORM
PLOTT 99-07-21 KRAETSCH
ROHDE&SCHWARZ
AEND. NR. AENDERUNGS-MITTEILUNG DATUM NAME
ZUGERAET CMU
BENENNUNG
MOTHERBOARD
TOP/TOP 2
22
ZEICHN.-NR 1100.0808.21 S
BLATT-NR
REG.-Nr. 1100.0008
ERSTELL 1100.0008.01

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
DIGITAL BOARD		
X74 A1		
X74 A2	LH1MID0	(9/2B)
X74 A3	LH1MID1	(9/10D)
X74 A4	LH1MID2	(9/10D)
X74 A5	LH1MID3	(9/10D)
X74 A6	LH1MID4	(9/10D)
X74 A7	LH1MID5	(9/10D)
X74 A8	LH1MID6	(9/10D)
X74 A9	LH1MID7	(9/10D)
X74 A10	LH1MID8	(9/10C)
X74 A11	LH1MID9	(9/10C)
X74 A12	LH1MID10	(9/10B)
X74 A13	LH1MID11	(9/10B)
X74 A14	LH1MOD0	(9/2B)
X74 A15	LH1MOD1	(9/10D)
X74 A16	LH1MOD2	(9/10D)
X74 A17	LH1MOD3	(9/10D)
X74 A18	LH1MOD4	(9/10D)
X74 A19	LH1MOD5	(9/10D)
X74 A20	LH1MOD6	(9/10D)
X74 A21	LH1MOD7	(9/10D)
X74 A22	LH1MOD8	(9/8D)
X74 A23	LH1MOD9	(9/8D)
X74 A24	LH1MOD10	(9/10C)
	LH1MOD11	(9/10C)
X74 B1		
X74 B2	LH1MIQCLK	(9/10B)
X74 B3		
X74 B4	LH1TBUS1	(9/10D,10/10D)
X74 B5	LH1TBUS2	(9/10D,10/10D)
X74 B6	LH1TBUS3	(9/10D,10/10D)
X74 B7	LH1TBUS4	(9/10E,10/10D)
X74 B8	LH1TBUS5	(9/10E,10/10D)
X74 B9	LH1TBUS6	(9/2D,10/10D)
X74 B10	LH1TBUS7	(9/2D,10/10D)
X74 B11	LH1TBUS8	(9/5B)
X74 B12		
X74 B13	LH1DEMSERDAT1	(9/2E)
X74 B14	LH1DEMSERDAT2	(9/2E)
X74 B15	LH1DEMSERCLK	(9/2E)
X74 B16	LH1DEMSERSTRB	(9/2E)
X74 B17		
X74 B18		
X74 B19		
X74 B20		
X74 B21		
X74 B22	LH1SCIEXTRXD	(9/8E)
X74 B23	LH1SCIEXTTXD	(9/8E)
X74 B24	LH1SCIEXTSCLK	(9/8E)

COMPONENT/PIN	SIGNAL	ON SHEET
DIGITAL BOARD		
X74 C1	LH2MID0	(6/2B)
X74 C2	LH2MID1	(6/10D)
X74 C3	LH2MID2	(6/10D)
X74 C4	LH2MID3	(6/10D)
X74 C5	LH2MID4	(6/10D)
X74 C6	LH2MID5	(6/10D)
X74 C7	LH2MID6	(6/10D)
X74 C8	LH2MID7	(6/10D)
X74 C9	LH2MID8	(6/10C)
X74 C10	LH2MID9	(6/10C)
X74 C11	LH2MID10	(6/10C)
X74 C12	LH2MID11	(6/10B)
X74 C13	LH2MOD0	(6/2B)
X74 C14	LH2MOD1	(6/10D)
X74 C15	LH2MOD2	(6/10D)
X74 C16	LH2MOD3	(6/10D)
X74 C17	LH2MOD4	(6/10D)
X74 C18	LH2MOD5	(6/10D)
X74 C19	LH2MOD6	(6/10D)
X74 C20	LH2MOD7	(6/10D)
X74 C21	LH2MOD8	(6/8D)
X74 C22	LH2MOD9	(6/8D)
X74 C23	LH2MOD10	(6/10C)
X74 C24	LH2MOD11	(6/10C)
X74 D1		
X74 D2	LH2MIQCLK	(6/10B)
X74 D3		
X74 D4	LH2TBUS1	(6/10D)
X74 D5	LH2TBUS2	(6/10D)
X74 D6	LH2TBUS3	(6/10D)
X74 D7	LH2TBUS4	(6/10E)
X74 D8	LH2TBUS5	(6/10E)
X74 D9	LH2TBUS6	(6/2D)
X74 D10	LH2TBUS7	(6/2D)
X74 D11	LH2TBUS8	(6/5B)
X74 D12		
X74 D13	LH2DEMSERDAT1	(6/2E)
X74 D14	LH2DEMSERDAT2	(6/2E)
X74 D15	LH2DEMSERCLK	(6/2E)
X74 D16	LH2DEMSERSTRB	(6/2E)
X74 D17		
X74 D18		
X74 D19		
X74 D20		
X74 D21		
X74 D22	LH2SCIEXTRXD	(6/8E)
X74 D23	LH2SCIEXTTXD	(6/8E)
X74 D24	LH2SCIEXTSCLK	(6/8E)

COMPONENT/PIN	SIGNAL	ON SHEET
DIGITAL BOARD		
X75 A1	SD0	(2/5F,3/5B,4/5C,4/11C,5/11C) (6/9C,9/9C,11/9C,11/11A) (12/9A)
X75 A2	SD1	
X75 A3	SD2	
X75 A4	SD3	
X75 A5	SD4	
X75 A6	SD5	
X75 A7	SD6	
X75 A8	SD7	
X75 A9	SD8	
X75 A10	SD9	
X75 A11	SD10	
X75 A12	SD11	
X75 A13	SD12	
X75 A14	SD13	
X75 A15	SD14	
X75 A16	SD15	
X75 A17		
X75 A18		
X75 A19	IOW	(2/2E,3/8C,5/8D,6/8D,9/8D) (11/2C,11/11D,12/11B)
X75 A20	IOR	(2/2E,3/8C,5/8D,6/8D,9/8D) (11/2C,11/11D,12/11C)
X75 A21	SMEMR	(2/2C,3/8C,4/5D,4/11D,5/8C) (6/8E,9/8D,11/2B,11/11E)
X75 A22	SMEMW	(2/2C,3/8C,4/5D,4/11D,5/8C) (6/8E,9/8E,11/2C,11/11E)
X75 A23	IOCS16	(2/5D,3/8C,5/10E,11/5E,12/7C)
X75 A24		
X75 B1	SA0	(2/5E,3/8D,4/5B,4/11B,5/11B) (6/11B,9/11B,11/8B,11/8A) (12/6C)
X75 B2	SA1	
X75 B3	SA2	
X75 B4	SA3	
X75 B5	SA4	
X75 B6	SA5	
X75 B7	SA6	
X75 B8	SA7	
X75 B9	SA8	
X75 B10	SA9	
X75 B11	SA10	
X75 B12	SA11	
X75 B13	SA12	
X75 B14	SA13	
X75 B15	SA14	
X75 B16	SA15	
X75 B17	SA16	
X75 B18	SA17	
X75 B19	SA18	
X75 B20	SA19	
X75 B21	AEN	(2/2D,3/8C,4/5C,4/11C,5/8E) (11/2E,11/11E,12/11B)
X75 B22		
X75 B23	RESDRV	(2/2D,3/8C,4/5D,4/11D,5/8C) (6/2E,9/2E,11/2E,12/11B)
X75 B24		

COMPONENT/PIN	SIGNAL	ON SHEET
DIGITAL BOARD		
X75 C1	IRQ3	(2/5D,3/8E,5/10D,12/7B)
X75 C2	IRQ4	(2/5B,3/8E,5/10C,12/7B)
X75 C3	IRQ5	(2/5D,3/8E,5/10E,12/7B)
X75 C4	IRQ6	(2/5B,3/8E,5/10C)
X75 C5	IRQ7	(2/5D,3/8E,5/10E,12/7B)
X75 C6	IRQ9	(2/2E,3/8E,5/8D,12/7B)
X75 C7	IRQ10	(2/2C,3/8E,5/8C,12/7B)
X75 C8	IRQ11	(2/2C,3/8E,5/8C,12/7B)
X75 C9	IRQ12	(2/2B,3/8E,5/8C,12/7B)
X75 C10	IRQ14	(2/2B,3/8E,5/8C,12/7B)
X75 C11	IRQ15	(2/2B,3/8E,5/8C,12/7B)
X75 C12	IRQ16	(2/8C)
X75 C13	IRQ17	(2/8C)
X75 C14	IRQ18	(2/8C)
X75 C15	IRQ19	(2/8C)
X75 C16	AUDIOIRQ	(16/5D)
X75 C17	AUDIOAEN	(16/5C)
X75 C18	REFAEN	(16/5C)
X75 C19	BSA0	(16/5D)
X75 C20	BSA1	(16/5D)
X75 C21	BSA2	(16/5D)
X75 C22	BSA3	(16/5D)
X75 C23	BIOR	(16/5D)
X75 C24	BIOW	(16/5D)
X75 D1	PFCINT	(16/5D)
X75 D2	RXTX1POWERINT	(4/5D)
X75 D3	RXTX2POWERINT	(4/11D)
X75 D4	IMODFILAUC1	(5/5D)
X75 D5	OMODFILAUC1	(5/5D)
X75 D6	IMODTOAUC1	(5/5D)
X75 D7	OMODTOAUC1	(5/5D)
X75 D8	IMODFILAUC2	(5/5D)
X75 D9	OMODFILAUC2	(5/5D)
X75 D10	IMODTOAUC2	(5/5D)
X75 D11	OMODTOAUC2	(5/5D)
X75 D12		
X75 D13		
X75 D14	BRESET	(16/5D)
X75 D15		
X75 D16	BSD0	(16/5D)
X75 D17	BSD1	(16/5D)
X75 D18	BSD2	(16/5D)
X75 D19	BSD3	(16/5D)
X75 D20	BSD4	(16/5D)
X75 D21	BSD5	(16/5D)
X75 D22	BSD6	(16/5D)
X75 D23	BSD7	(16/5D)
X75 D24		

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

AEND IND	AENDERUNGS-MITTEILUNG	DATUM	NAME
01 00			

1CMK	DATUM	NAME
BEARB		KR
GEPR		KR
NORM		
PLOTT	99-07-01	KRAETSCH

ROHDE & SCHWARZ

ZUGERAET CMU

BENENNUNG: MOTHERBOARD

TOP, TOP S

ZEICHN.-NR: 1100.0908.01 S

BLATT-NR: 23 S +

REG.-Nr. 1100.0008

ERSTELL: 1100.0008.11

CONNECTOR DEFINITIONS MBT

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 1		
X81 A1	+5VREF	(3/2B,4/2B,4/8B,5/2B,6/2B) (7/2B,10/8B,13/11B,16/2B)
X81 A2		
X81 A3	+12V	
X81 A4		
X81 A5		
X81 A6	+5.2V C208 10N	
X81 A7		
X81 A8		
X81 A9	+8V	
X81 A10		
X81 A11	+12V	
X81 A12	LH1MIDO	(8/2B)
X81 A13	LH1MODO	(8/2C)
X81 A14		
X81 A15	LH1SERCLK	(7/8C)
X81 A16	LH1SERLDDATA	(7/8C)
X81 A17	LH1SERLDFRAME	(7/8C)
X81 A18	LH1SERDLDATA	(7/8C)
X81 A19	LH1PRISYNTHENRES (n.c.)	
X81 A20	LH1SERDLFRAME	(7/8D)
X81 A21	LH1PRITXI	(7/8D)
X81 A22	LH1PRITXQ	(7/8D)
X81 A23	LH1PRITXIOGND	(7/8D)
X81 A24	LH1TXSET	(7/8D)
X81 A25	LH1RXSET	(7/8D)
X81 A26 R254 220	LH1POWREGSTRB	(7/8D,10/100)
X81 A27	LH1RSVD1	(7/8D)
X81 A28	LH1SECSYNTHENRES (n.c.)	
X81 A29	LH1RSVD2	(7/8D)
X81 A30	LH1SECTXI	(7/8D)
X81 A31	LH1SECTXQ	(7/8D)
X81 A32	LH1SECTXIOGND	(7/8D)
X81 B1	LH1LEVCLK (n.c.)	
X81 B2	LH1LEVDATA (n.c.)	
X81 B3	+3.3V C209 10N	
X81 B4		
X81 B5		
X81 B6		
X81 B7	LH1AFGENMON	(3/2C,16/2D)
X81 B8	LH1HANDSETIN	(13/3E,16/2D)
X81 B9	LH1HANDSETOUT	(13/3E,16/2D)
X81 B10		
X81 B11	LH1TBUS6	(8/2D,10/100)
X81 B12	LH1TBUS7	(8/2D,10/100)
X81 B13		
X81 B14		
X81 B15		
X81 B16		
X81 B17		
X81 B18		
X81 B19	LH1RES1	(16/5C)
X81 B20		
X81 B21	RESDRV	(2/2D,3/8C,4/5D,4/110,5/8E) (6/2E,8/8E,11/2E,12/11B)
X81 B22		
X81 B23		
X81 B24	LH1DEMSERDAT1	(8/2D)
X81 B25	LH1DEMSERDAT2	(8/2D)
X81 B26	LH1DEMSERCLK	(8/2D)
X81 B27	LH1DEMSERSTRB	(8/2D)
X81 B28	LH1XSPTXRDY	(16/5C)
X81 B29	LH1BSPBFI	(16/5C)
X81 B30	LH1XSPSP	(16/5C)
X81 B31	LH1BSPTXSFM	(16/5C)
X81 B32	LH1PRISPTAF	(16/5C)

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 1		
	C222 100N	
X81 C1	LH1GND	(13/3C)
X81 C2	LH1RIA	(13/3C)
X81 C3	LH1DTRA	(13/3E)
X81 C4	LH1CTSA	(13/3C)
X81 C5	LH1TXDA	(13/3C)
X81 C6	LH1RTSA	(13/3C)
X81 C7	LH1RXDA	(13/3E)
X81 C8	LH1DSRA	(13/3E)
X81 C9	LH1DCDA	(13/3E)
X81 C10	LH1SERVGND	(13/3E)
X81 C11	LH1TBUS8	(8/2D)
X81 C12		
X81 C13	LH1DID4	(7/8B)
X81 C14	LH1DID5	(7/8B)
X81 C15	LH1DID6	(7/8B)
X81 C16	LH1DID7	(7/8B)
X81 C17	LH1DID8	(7/8B)
X81 C18	LH1DID9	(7/8B)
X81 C19	LH1DID10	(7/8B)
X81 C20	LH1DID11	(7/8B)
X81 C21		
X81 C22	LH1DQD4	(7/8C)
X81 C23	LH1DQD5	(7/8C)
X81 C24	LH1DQD6	(7/8C)
X81 C25	LH1DQD7	(7/8C)
X81 C26	LH1DQD8	(7/8C)
X81 C27	LH1DQD9	(7/8C)
X81 C28	LH1DQD10	(7/8C)
X81 C29	LH1DQD11	(7/8C)
X81 C30	LH1DIQCLK	(7/2C)
X81 C31		
X81 C32	LH1NETCLK	(7/2C,10/100)
X82 A1	+3.3V	
X82 A2		
X82 A3		
X82 A4		
X82 A5		
X82 A6 R231 0	(LH1DO)	
X82 A7 R232 0	(LH1D1)	
X82 A8	COLH1RES1	(10/10B)
X82 A9	COLH1RES2	(10/10B)
X82 A10	COLH1RES3	(10/10B)
X82 A11	COLH1RES4	(10/10B)
X82 A12	COLH1RES5	(10/10B)
X82 B1	COLH1RES6	(10/10B)
X82 B2	COLH1RES7	(10/10C)
X82 B3	COLH1RES8	(10/10C)
X82 B4	LH1CORES1	(10/10C)
X82 B5	LH1CORES2	(10/10C)
X82 B6	LH1CORES3	(10/10C)
X82 B7	LH1CORES4	(10/10C)
X82 B8	LH1CORES5	(10/10C)
X82 B9	LH1CORES6	(10/10C)
X82 B10	LH1CORES7	(10/10C)
X82 B11	LH1CORES8	(10/10C)
X82 B12	LH1CORES9	(10/10C)

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 1		
X82 C1	LH1LH2CON1	(6/8B)
X82 C2	LH1LH2CON2	(6/8B)
X82 C3	LH1LH2CON3	(6/8B)
X82 C4	LH1LH2CON4	(6/8B)
X82 C5	LH1LH2CON5	(6/8B)
X82 C6	LH1LH2CON6	(6/8B)
X82 C7	LH1LH2CON7	(6/8B)
X82 C8	LH1LH2CON8	(6/8B)
X82 C9	LH1LH2CON9	(6/8B)
X82 C10	LH1LH2CON10	(6/8B)
X82 C11	LH1LH2CON11	(6/8B)
X82 C12	LH1LH2CON12	(6/8B)
X82 D1	LH2LH1CON1	(6/8C)
X82 D2	LH2LH1CON2	(6/8C)
X82 D3	LH2LH1CON3	(6/8C)
X82 D4	LH2LH1CON4	(6/8C)
X82 D5	LH2LH1CON5	(6/8C)
X82 D6	LH2LH1CON6	(6/8C)
X82 D7	LH2LH1CON7	(6/8C)
X82 D8	LH2LH1CON8	(6/8C)
X82 D9	LH2LH1CON9	(6/8C)
X82 D10	LH2LH1CON10	(6/8C)
X82 D11	LH2LH1CON11	(6/8C)
X82 D12	LH2LH1CON12	(6/8C)
X83 A1		
X83 A2		
X83 A3		
X83 A4	SD0	(2/6F,3/8B,4/6C,4/11C,5/11C) (6/9C,8/9B,11/8C,11/11A) (12/6A)
X83 A5	SD1	
X83 A6	SD2	
X83 A7	SD3	
X83 A8	SD4	
X83 A9	SD5	
X83 A10	SD6	
X83 A11	SD7	
X83 A12	LH1DID3	(7/8B)
X83 A13	LH1DID2	(7/8B)
X83 A14	LH1DID1	(7/8B)
X83 A15	LH1DID0	(7/8B)
X83 A16	LH1DQD3	(7/8C)
X83 A17	LH1DQD2	(7/8C)
X83 A18	LH1DQD1	(7/8C)
X83 A19	LH1DQD0	(7/8C)
X83 A20		
X83 A21	LH1MOD9	(8/2C)
X83 A22	LH1MOD8	(8/2C)
X83 A23	IOW	(2/2E,3/8C,5/8D,6/8D,8/8C) (11/2C,11/11D,12/11B)
X83 A24	IOR	(2/2E,3/8C,5/8D,6/8D,8/8C) (11/2C,11/11D,12/11C)
X83 A25	SMEMR	(2/2C,3/8C,4/5D,4/110,5/8C) (6/8E,8/8C,11/2B,11/11E)
X83 A26	SMEMW	(2/2C,3/8C,4/5D,4/110,5/8C) (6/8E,8/8C,11/2C,11/11E)
X83 A27		
X83 A28	LH1SCIEXTRXD	(8/2D)
X83 A29	LH1SCIEXTTXD	(8/2D)
X83 A30	LH1SCIEXTSCLK	(8/2D)
X83 A31		
X83 A32	LH1NETCLKOUT (n.c.)	
	C210 +5.2V 10N	
	C211 +3.3V 10N	

COMPONENT/PIN	SIGNAL	ON SHEET
UNIVERSAL SIGN. UNIT 1		
X83 B1	SA0	(2/6C,3/8D,4/6B,4/11B,5/11B)
X83 B2	SA1	
X83 B3		
X83 B4		
X83 B5		
X83 B6		
X83 B7		
X83 B8		
X83 B9		
X83 B10		
X83 B11		
X83 B12		
X83 B13	LH1MIQCLK	(8/2C)
X83 B14	LH1MID11	(8/2B)
X83 B15	LH1MID10	(8/2B)
X83 B16	LH1MID9	(8/2B)
X83 B17	LH1MID8	(8/2B)
X83 B18	LH1MOD11	(8/2C)
X83 B19	LH1MOD10	(8/2C)
X83 B20		
X83 B21 R253 100	DIAGNOSE	(3/20,5/20,6/10C,7/2C,10/8C) (13/11C,16/2C)
X83 B22		
X83 B23		
X83 B24	LH1SECEXTI (n.c.)	
X83 B25	LH1SECEXTQ (n.c.)	
X83 B26		
X83 B27	LH1PRIEXTRAMP (n.c.)	
X83 B28		
X83 B29	LH1PRIEXTI (n.c.)	
X83 B30		
X83 B31	LH1PRIEXTO (n.c.)	
X83 B32		
X83 C1		
X83 C2		
X83 C3	LH1MID1	
X83 C4	LH1MID2	
X83 C5	LH1MID3	
X83 C6	LH1MID4	
X83 C7	LH1MID5	
X83 C8	LH1MID6	
X83 C9	LH1MID7	
X83 C10		
X83 C11	LH1MOD1	
X83 C12	LH1MOD2	
X83 C13	LH1MOD3	
X83 C14	LH1MOD4	
X83 C15	LH1MOD5	
X83 C16	LH1MOD6	
X83 C17	LH1MOD7	
X83 C18		
X83 C19	LH1TBUS1	
X83 C20	LH1TBUS2	
X83 C21	LH1TBUS3	
X83 C22	LH1TBUS4	(8/2D,10/100)
X83 C23	LH1TBUS5	(8/2D,10/100)
X83 C24	LH1SIGINT	(13/2C,7/50)
X83 C25	POWERINT	(6/10E,7/50,13/11C)
X83 C26		
X83 C27	LH1CSDPRAM	(7/50)
X83 C28	LH1	
X83 C29	LH1	
X83 C30	LH1	
X83 C31	LH1	
X83 C32	LH1	

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

AEND IND	AENDERUNGS MITTEILUNG	DATUM	NAME
01.00			

	DATUM	NAME
ÜBERPR		
BEARB		KR
GEPR.		KR
NORM		
PLOTT	99-07-01	KRAENICH

ROHDE&SCHWARZ

BENENNUNG: MOTHERBOARD

TOP TOP 9

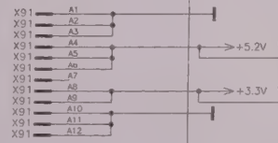
ZEICHN.-NR. 1100.0008.11

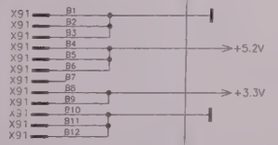
BLATT-NR. 24

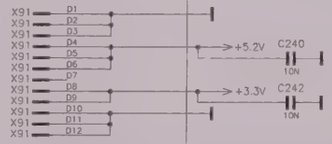
PROJ. 1100.0008 ERSTELL 1100.0008.01

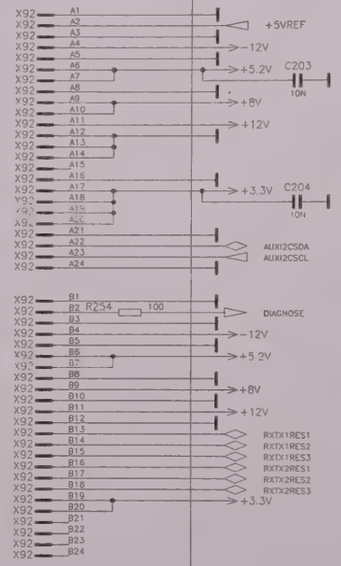
CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET	COMPONENT/PIN	SIGNAL	ON SHEET	COMPONENT/PIN	SIGNAL	ON SHEET	COMPONENT/PIN	SIGNAL	ON SHEET
USU1 CO-PROCESSOR			USU1 CO-PROCESSOR			USU1 CO-PROCESSOR			USU1 CO-PROCESSOR		









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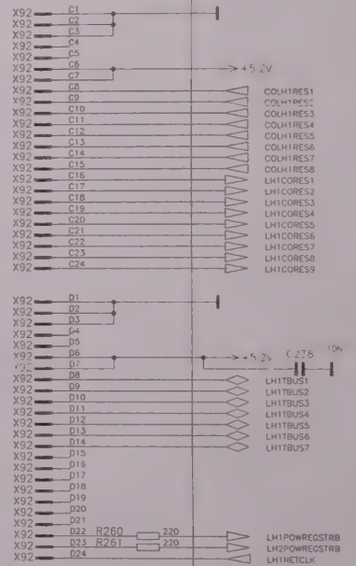
(7/2B,9/2B,13/11B,16/2B)

(3/2C,5/2C,7/2D,14/11C)
(3/2C,5/2C,7/2D,14/11C)

(3/2D,5/2D,6/10C,7/2C,9/10C)
(13/11C,16/2C)

(4/2C,5/2D,7/8D)
(4/2C,5/2D)
(4/2C,5/2D)
(4/8C,5/2D,7/10D)
(4/8C,5/2D)
(4/8C,5/2D)



(8/2C,9/10D)
(8/2C,9/10D)
(8/2C,9/10D)
(8/2D,9/10E)
(8/2D,9/10E)
(8/2D,9/20)
(8/2D,9/20)

(7/8D,9/3C)
(6/2C,7/10D)
(7/2C,9/5C)

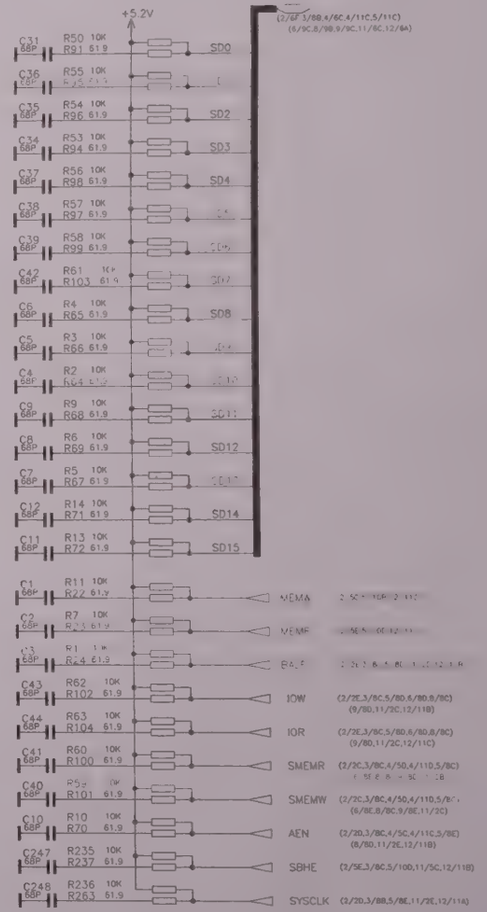
FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

01 00						ICM:	DATUM	NAME	BENENNUNG		
						BEARB		KR	MOTHERBOARD		
						GEPR		KR			
						NORM					
						PLOTT	99-07-01	KRAETSCH	TOP TOPIC		25
						ROHDE&SCHWARZ			ZEICHN.-NR		BLATT-NR
										1100.0908.01 S	10 +
AEND. IND	AENDERUNGS-MITTEILUNG	DATUM	NAME			Z. GERAET CML			REG.: 1100.0008	ERSTE Z: 1100.0008.01	

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET	COMPONENT/PIN	SIGNAL	ON SHEET
USU1 CO-PROCESSOR			USU1 CO-PROCESSOR		
X93 A1	+12V		X93 C1		
X93 A2	-12V		X93 C2	SA0	(2/6C.3/8D.4/6B.4/11B.5/11B) (6/11B.8/9C.9/11B.11/8A.12/8C)
X93 A3			X93 C3	SA2	
X93 A4	+5.2V C205 10N		X93 C4	SA4	
X93 A5			X93 C5	SA6	
X93 A6			X93 C6	SA8	
X93 A7			X93 C7	SA10	
X93 A8			X93 C8	SA12	
X93 A9	SMEMR	(2/2C.3/8C.4/50.4/11D.5/8C) (6/8E.8/8C.9/8D.11/11E)	X93 C9	SA14	
X93 A10	SMEMW	(2/2C.3/8C.4/50.4/11D.5/8C) (6/8E.8/8C.9/8E.11/11E)	X93 C10	SA16	
X93 A11			X93 C11	SA18	
X93 A12			X93 C12		
X93 A13			X93 C13		
X93 A14			X93 C14		
X93 A15			X93 C15		
X93 A16			X93 C16		
X93 A17			X93 C17		
X93 A18			X93 C18		
X93 A19			X93 C19	SD8	(2/6F.3/8B.4/6C.4/11C.5/11C) (6/9C.8/9B.9/9C.11/11A.12/6A)
X93 A20			X93 C20	SD10	
X93 A21			X93 C21	SD12	
X93 A22			X93 C22	SD14	
X93 A23			X93 C23	MEMCS16	(2/5B.5/10C.12/7C)
X93 A24			X93 C24		
X93 B1	IOR	(2/2E.3/8C.5/8D.6/8D.8/8C) (9/8D.11/11D.12/11C)	X93 D1		
X93 B2	IOW	(2/2E.3/8C.5/8D.6/8D.8/8C) (9/8D.11/11D.12/11B)	X93 D2	SBHE	(2/5E.3/8C.5/10D.11/11E)(12/11B)
X93 B3	BALE	(2/2E.3/8C.5/8D.11/11D.12/11B)	X93 D3	SA1	
X93 B4			X93 D4	SA3	
X93 B5			X93 D5	SA5	
X93 B6			X93 D6	SA7	
X93 B7			X93 D7	SA9	
X93 B8			X93 D8	SA11	
X93 B9			X93 D9	SA13	
X93 B10	SD0		X93 D10	SA15	
X93 B11	SD1		X93 D11	SA17	
X93 B12	SD2		X93 D12	SA19	
X93 B13	SD3		X93 D13		
X93 B14	SD4		X93 D14		
X93 B15	SD5		X93 D15		
X93 B16	SD6		X93 D16		
X93 B17	SD7		X93 D17		
X93 B18			X93 D18		
X93 B19	IOCHRDY	(2/2D.3/8C.4/50.4/11D.5/8E) (12/7C)	X93 D19		
X93 B20	AEN	(2/2D.3/8C.4/5C.4/11C.5/8E) (8/8D.11/11E.12/11B)	X93 D20	SD9	
X93 B21	RESDRV	(2/2D.3/8C.4/50.4/11D.5/8C) (6/2E.8/8E.9/2E.12/11B)	X93 D21	SD11	
X93 B22	OWS	(2/2D.5/8E.12/7C)	X93 D22	SD13	
X93 B23			X93 D23	SD15	
X93 B24	SYSCLK	(2/2D.3/8B.5/8E.11/11E.12/11A)	X93 D24	IOCS16	(2/5D.3/8C.5/10C.8/8C.12/7C)

ISA-TERMINATION



IND	AENDERUNGS-MITTEILUNG	DATUM	NAME
01.00			

	DATUM	NAME
1CMK	DATUM	NAME
BEARB.		KR
GEPR.		KR
NORM		
PLOTT	99-07-01	KRAETSCH

ROHDE&SCHWARZ

ZU GERAET CMU

BENENNUNG: MOTHERBOARD

TOP/TOP.11

ZEICHN.-NR. 1100.0908.01 S

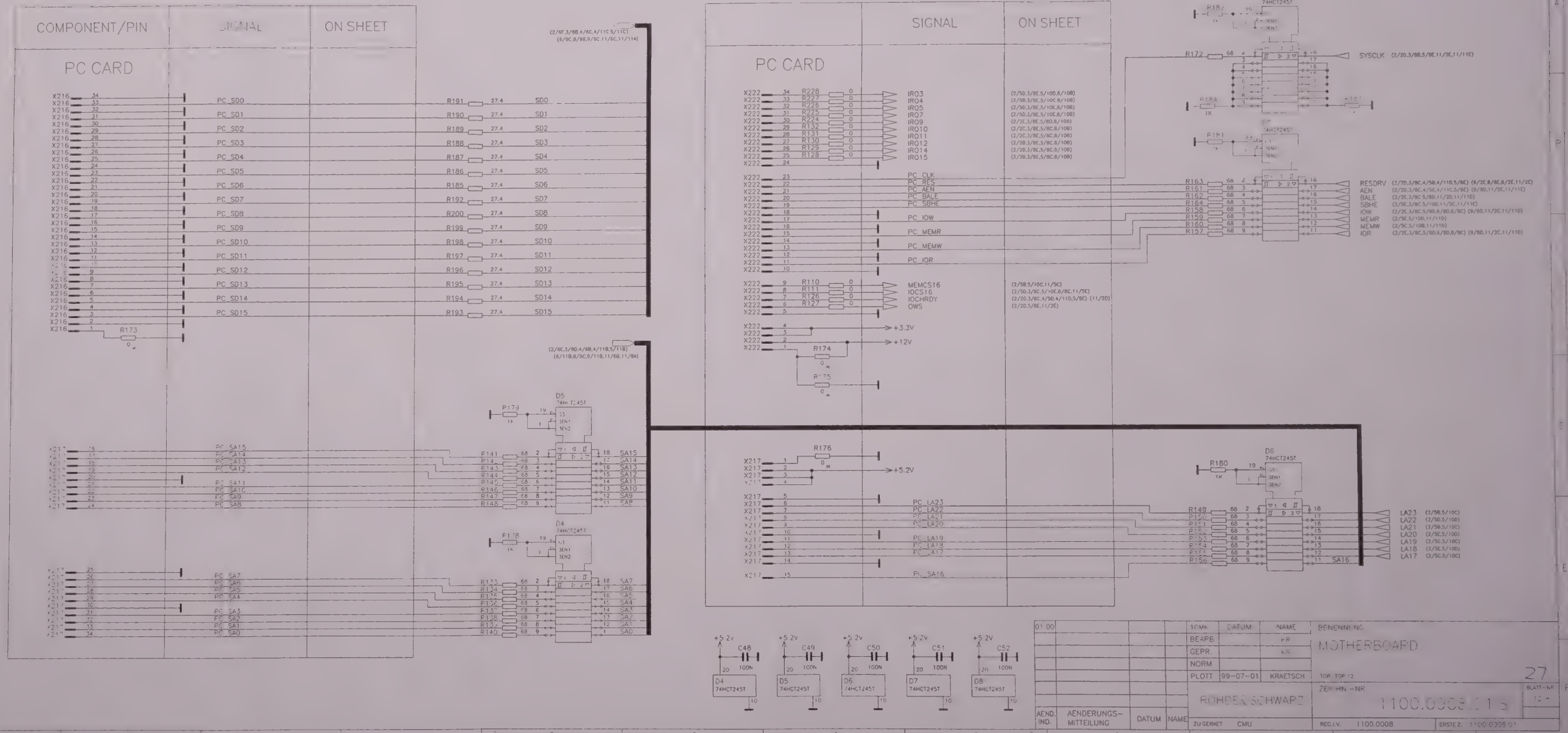
BLATT-NR. 11 + 26

REG I.V. 1100.0008

ERSTE Z. 1100.0008.01

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

CONNECTOR DEFINITIONS MB1



FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

01 00				10MK	DATUM	NAME	BENENNUNG
				BEARB		KR	MOTHERBOARD
				GEPR.		KR	
				NORM			
				PLOTT	99-07-01	KRAETSCH	TOP: TOP 12
							ZEICHN.-NR. 1100.0008.01 5
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE & SCHWARZ			BLATT-NR. 27
				ZU GERAET CMU			REG.I.V. 1100.0008 ERSTE Z. 1100.0005.01

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
FRONT PANEL BOARD		
X219	+5VKEYB	(14/5B,14/11C,15/8B)
X219	LEDRF4IN	(7/5E)
X219	LEDRF3OUT	(7/5E)
X219	LEDRF2IN	(7/5E)
X219	LEDRF2OUT	(7/5E)
X219	LEDRF1IN	(7/5E)
X219	LEDRF1OUT	(7/5E)
X219	LH1HANDSETIN	(9/20,16/20)
X219	LH1HANDSETOUT	(9/20,16/20)
X219	LH2HANDSETIN	(6/20,16/20)
X219	LH2HANDSETOUT	(6/20,16/20)
X219	LH1DCDA	(9/5B)
X219	LH1DSRA	(9/5B)
X219	LH1RXDA	(9/5B)
X219	LH1RTSA	(9/5B)
X219	LH1TXDA	(9/5B)
X219	LH1CTSA	(9/5B)
X219	LH1DTRA	(9/5B)
X219	LH1RIA	(9/5B)
X219	LH1GND	(9/5B)
X219	LH1SERVGND	(9/5B)
X219	LH2DCDA	(6/5B)
X219	LH2DSRA	(6/5B)
X219	LH2RXDA	(6/5B)
X219	LH2RTSA	(6/5B)
X219	LH2TXDA	(6/5B)
X219	LH2CTSA	(6/5B)
X219	LH2DTRA	(6/5B)
X219	LH2RIA	(6/5B)
X219	LH2GND	(6/5B)
X219	LH2SERVGND	(6/5B)

COMPONENT/PIN	SIGNAL	ON SHEET
OCXO BOARD		
X212	OPTOCXO1	(16/2D)
X212	SOCXO	(16/2D)
X212	+12VSTANDBY	(2/10C,15/9E,15/11D,16/2C)
X212	+5.2V	
X212	RFOCXO	(16/2D)
X212	OPTOCXO2	(16/2D)

COMPONENT/PIN	SIGNAL	ON SHEET
FLOPPY		
X218	+5.2V	
X218	IDX	(2/8D)
X218	+5.2V	
X218	DS2	(2/10C)
X218	+5.2V	
X218	DCHG	(2/10D)
X218	MO2	(2/8D)
X218	DIRC	(2/10C)
X218	STEP	(2/10D)
X218	WD	(2/8D)
X218	WE	(2/10C)
X218	TRK0	(2/10D)
X218	WP	(2/8D)
X218	RDD	(2/10C)
X218	HS	(2/10D)

COMPONENT/PIN	SIGNAL	ON SHEET
FRONTEND BOARD		
X215	+5.2V	
X215	+12V	
X215	GNDFAN	
X215	+28V	
X215	+8V	
X215	+5VREF	(3/2B,4/2B,4/8B,5/2B,6/2B) (7/2B,9/2B,10/2B,16/2B)
X215	DIAGNOSE	(3/2D,5/2D,6/10C,7/2C,9/10C) (10/8C,16/2C)
X215	POWERINT	(6/10E,7/5D,9/10E)
X215	30DBATT1	(4/2C)
X215	FERXAMP1	(4/2C)
X215	30DBATT2	(4/8C)
X215	FERXAMP2	(4/8C)
X215	FEI2CSDA	(7/2D)
X215	FEI2CSCL	(7/2D)
X215	ADXIN	(7/2D)
X215	ADSCL	(7/2D)
X215	ADSDATA	(7/2D)
X215	ADSCAL	(7/2D)
X215	ADRD	(7/2D)
X215	ADCS	(7/2D)

01.00				ICMK	DATUM	NAME	BENENNUNG
				BEARB		KR	MOTHERBOARD
				GEPR		KR	
				NORM			TOP SHEET 1
				PLOTT	99-07-01	KRAETSCH	28
							ZEICHN.-NR. 1100.3808.01 S
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			BLATT-NR.
				ZU GERAET CMU			REF. V 1100.0008 ERSTELL 1100.0008.01

FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
REAR PANEL BOARD 1		
X205 1	D4	(2/10C)
X205 2	D0	(2/8D)
X205 3	D5	(2/10D)
X205 4	D1	(2/10C)
X205 5	D6	(2/8D)
X205 6	D2	(2/10D)
X205 7	D7	(2/10B)
X205 8	D3	(2/8D)
X205 9	REN	(2/10D)
X205 10	EOI	(2/10B)
X205 11	DAV	(2/8D)
X205 12	NRFD	(2/10C)
X205 13	NDAC	(2/10C)
X205 14	IFC	(2/8D)
X205 15	SRQ	(2/10D)
X205 16	ATN	(2/10B)
X205 17	SCLT	(2/8C)
X205 18	PE	(2/8C)
X205 19	BUSY	(2/10B)
X205 20	ACK	(2/10C)
X205 21	PD7	(2/8C)
X205 22	PD6	(2/10B)
X205 23	PD5	(2/10C)
X205 24	PD4	(2/8C)
X205 25	PD3	(2/10B)
X205 27	SLIN	(2/10C)
X205 28	PD2	(2/8D)
X205 29	INIT	(2/10B)
X205 30	PD1	(2/10D)
X205 31	ERR	(2/8D)
X205 32	PD0	(2/10B)
X205 33	AFD	(2/10D)
X205 34	STB	(2/8D)

COMPONENT/PIN	SIGNAL	ON SHEET
REAR PANEL BOARD 1		
X206 1	+5VKEYB	(13/3A14,13C15/8B)
X206 2	MSDAT	(2/10C)
X206 3	+EXCLK	(2/8D)
X206 4	MSCLK	(2/10D)
X206 5	KEYDAT	(2/10C)
X206 6		
X206 7		
X206 8	RI2	(2/8D)
X206 9	DTR2	(2/10D)
X206 10	CTS2	(2/10C)
X206 11	TXD2	(2/8D)
X206 12	RTS2	(2/10D)
X206 13	RXD2	(2/8D)
X206 14	DSR2	(2/8D)
X206 15	DCD2	(2/10D)
X206 16		
X206 17	RI1	(2/10B)
X206 18	DTR1	(2/8C)
X206 19	CTS1	(2/10C)
X206 20	TXD1	(2/10B)
X206 21	RTS1	(2/8C)
X206 22	RXD1	(2/10C)
X206 23	DSR1	(2/8B)
X206 24	DCD1	(2/8C)
X206 25		
X206 26	HSYNC	(2/8B,14/2F)
X206 27	VSYNC	(2/8B,14/2F)
X206 28		
X206 29	BLUE	(2/8C,14/2F)
X206 30		
X206 31	GREEN	(2/8B,14/2F)
X206 32		
X206 33	RED	(2/8B,14/2F)
X206 34		

COMPONENT/PIN	SIGNAL	ON SHEET
REAR PANEL BOARD 2		
X207 1		
X207 2	EXT1MODIIN	(5/5B)
X207 3	EXT1MODIIN	(5/5B)
X207 4		
X207 5	EXT1MODIOUT	(5/5B)
X207 6	EXT1MODIOUT	(5/5B)
X207 7		
X207 8	EXT1DEMODIIN	(5/5C)
X207 9	EXT1DEMODIIN	(5/5C)
X207 10		
X207 11	EXT1DEMODIOUT	(5/5C)
X207 12	EXT1DEMODIOUT	(5/5C)
X207 13		
X207 14	EXT2MODIIN	(5/5C)
X207 15	EXT2MODIIN	(5/5C)
X207 16		
X207 17	EXT2MODIOUT	(5/5C)
X207 18	EXT2MODIOUT	(5/5C)
X207 19		
X207 20	EXT2DEMODIIN	(5/5C)
X207 21	EXT2DEMODIIN	(5/5C)
X207 22		
X207 23	EXT2DEMODIOUT	(5/5C)
X207 24	EXT2DEMODIOUT	(5/5C)
X207 25		
X207 26		
X207 27		
X207 28		
X207 29		
X207 30		
X207 31		
X207 32		
X207 33		
X207 34		

COMPONENT/PIN	SIGNAL	ON SHEET
REAR PANEL BOARD 2		
X208 1		
X208 2		
X208 3		
X208 4		
X208 5		
X208 6		
X208 7		
X208 8	RESERVE8 (n.c.)	
X208 9	RESERVE7 (n.c.)	
X208 10		
X208 11		
X208 12		
X208 13		
X208 14		
X208 15		
X208 16		
X208 17	AUXI2CSCL	
X208 18		
X208 19		
X208 20	FUSEEXTTB	
X208 21		
X208 22		
X208 23		
X208 24		
X208 25		
X208 26	FUSEEXTTBUS7	
X208 27	FUSEEXTTBUS8	
X208 28	FUSEEXTTBUS9	
X208 29		
X208 30		
X208 31		
X208 32		
X208 33		
X208 34		

V28 PBYR245CT

F16 0AC

F17 0AC

+5.1V

V29 SS24

V30 SS24

R15 10K M	HSYNC	(2/8B,14/5C)
R16 10K M	VSYNC	(2/8B,14/5C)
R17 10K M	BLUE	(2/8C,14/5C)
R18 10K M	GREEN	(2/8B,14/5C)
R19 10K M	RED	(2/8B,14/5C)

01.00				ICMA	DATUM	NAME
				BEARB		KR
				GEPR		KR
				NORM		
				PLOTT	99-07-01	KRAETSCH
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ		

BENENNUNG: MOTHERBOARD

TOP_TOP 14

ZEICHN.-NR.: 1100.0008.01

BLATT NR. 14 + 29

GEZEICHNET: CMU

REG.-NR.: 1100.0008

ERSETZT: 1100.0008.01

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

CONNECTOR DEFINITIONS MB1

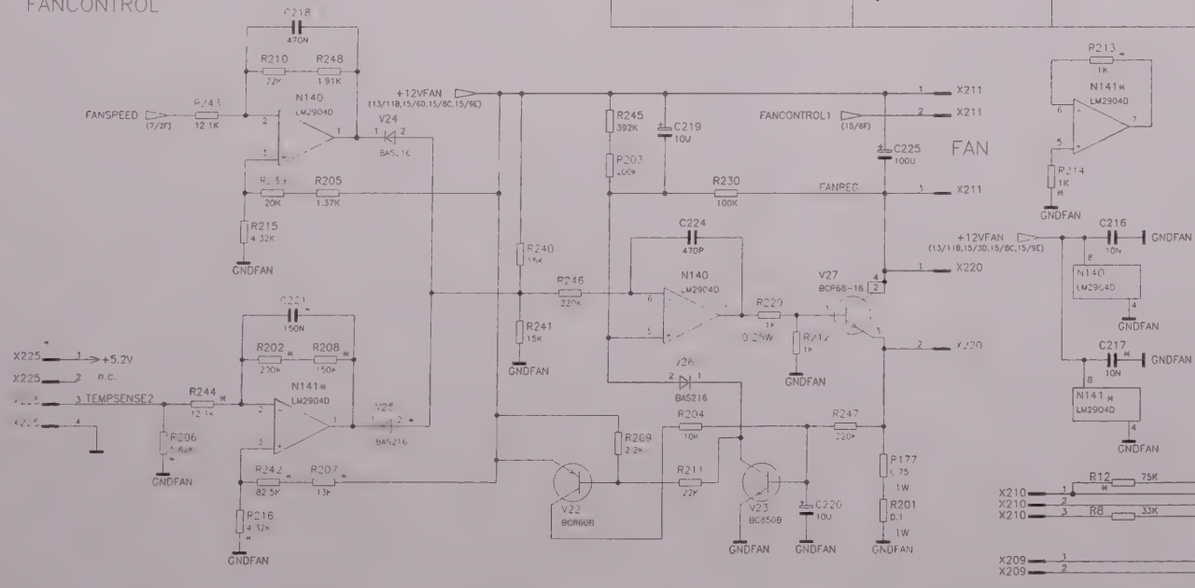
COMPONENT/PIN	SIGNAL	ON SHEET
ABISSYM 1/2		
X200 1	ABISRX2SYMA	(3/11B)
X200 2	ABISRX1SYMB	(3/20)
X200 3	ABISRX2SYMB	(3/11B)
X200 4	ABISTX1SYMA	(3/20)
X200 5	ABISTX2SYMA	(3/11B)
X200 6	ABISTX1SYMB	(3/20)
X200 7	ABISTX2SYMB	(3/11B)
X200 8		
X200 9	ABISRX1SYMA	(3/20)
X200 10 R238 0		

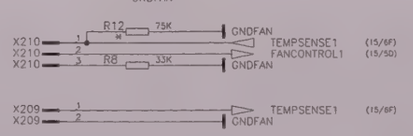
COMPONENT/PIN	SIGNAL	ON SHEET
ABISASYM2		
X201 SMB-ST	ABISRX2	(3/11B)
X202 SMB-ST	ABISTX2	(3/11B)
ABISASYM1		
X203 SMB-ST	ABISRX1	(3/20)
X204 SMB-ST	ABISTX1	(3/20)

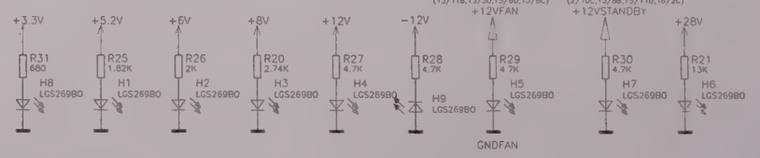
COMPONENT/PIN	SIGNAL	ON SHEET
POWER SUPPLY		
X110 A1	PWDOWN (n.c.)	
X110 A2	TEST 2 (n.c.)	
X110 A3	TEST 3 (n.c.)	
X110 A4		
X110 A5	+3.3V	
X110 A6	+5.2V	
X110 A7		
X110 A8		
X110 A9	F3 1A5	
X110 A10	+5VKEYB	(13/3A,14/5B,14/11C)
X110 A11		
X110 A12		
X110 A13		
X110 A14		
X110 A15		
X110 A16		
X110 A17		
X110 A18	+6V	
X110 A19	+8V	
X110 A20		
X110 A21		
X110 A22	+12V	
X110 A23		
X110 A24	+12VFAN	(13/11B,15/30,15/60,15/9E)
X110 B1	ONOFF	(2/80)
X110 B2		
X110 B3		
X110 B4		
X110 B5	+3.3V	
X110 B6	+5.2V	
X110 B7		
X110 B8		
X110 B9		
X110 B10		
X110 B11		
X110 B12		
X110 B13		
X110 B14		
X110 B15		
X110 B16	+6V	
X110 B17		
X110 B18	+8V	
X110 B19		
X110 B20		
X110 B21	+12V	
X110 B22	-12V	
X110 B23		
X110 B24	GNDFAN	

COMPONENT/PIN	SIGNAL	ON SHEET
POWER SUPPLY		
X110 D1	PWGOOD	(2/100)
X110 D16	+6V	
X110 D18	+8V	
X110 D21	+12V	
X110 D22	-12V	
X110 D23		
X110 D24	+12VSTANDBY	(2/10C,13/8B,15/9E,16/2C)

FANCONTROL







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ROHDE&SCHWARZ	Benennung / Designation: MOTHERBOARD				
Typ / Type: CMU	Datum / Date: 00-02-16	Abteilung / Dpt: 1CMK	Name: KRAETSCH		
1.Z used in: 1100.0008.01					

Zeichn. Nr. / Drawing No: 1100.0909.01 S

30

CONNECTOR DEFINITIONS MB1

COMPONENT/PIN	SIGNAL	ON SHEET
MOTHERBOARD 1/2 CONNECTOR	+5VREF	
	+12VSTANDBY	
	DIAGNOSE	
	DEMODIN	
X223 30	ABISSYNCOUT	(3/2E)
X223 35	RFOCXO	(13/8B)
	LH1HANDSETIN	(9/2D,13/3E)
	LH1HANDSETOUT	(9,2D,13,3E)
	LH2HANDSETIN	(6,2D,13,3E)
X223 48	LH2HANDSETOUT	(6/2D,13/3E)
X223 49	LH1AFGENMON	(3/2C,9/2D)

COMPONENT/PIN	SIGNAL	ON SHEET
MOTHERBOARD 1/2 CONNECTOR		
X224 1	SC120	(7/5F)
X224 2	SC110	(7/5F)
X224 3	SC100	(7/5F)
X224 4	STE10	(7/5F)
X224 5	SRE10	(7/5F)
X224 6	SCK10	(7/5F)
X224 7	SC020	(7/5F)
X224 8	SC010	(7/5E)
X224 9	SC000	(7/5E)
X224 10	STD00	(7/5E)
X224 11	SRD00	(7/5E)
X224 12	SCK00	(7/5E)
X224 13	LH1RFEST	(9/2D)
X224 14	LH1XSPTXRDY	(6/2E)
X224 15	LH1BSPBFI	(6/2E)
X224 16	LH1XSPSP	(6/2E)
X224 17	LH1BSPTXSFM	(6/2E)
X224 18	LH1PRISPTAF	(6/2E)
X224 19	LH2RFEST	(6/2E)
X224 20	LH2XSPTXRDY	(6/2E)
X224 21	LH2BSPBFI	(6/2E)
X224 22	LH2XSPSP	(6/2E)
X224 23	LH2BSPTXSFM	(6/2E)
X224 24	LH2PRISPTAF	(6/2E)
X224 25	AUDIOAEN	(8/10C)
X224 26	REFAEN	(8/10C)
X224 27	BSA1	(8/10C)
X224 28	BSA0	(8/10C)
X224 29	PFCINT	(8/10C)
X224 30	BSD7	(8/10D)
X224 31	BSD6	(8/10D)
X224 32	BSD5	(8/10D)
X224 33	BSD4	(8/10D)
X224 34	BSD3	(8/10D)
X224 35	BSD2	(8/10D)
X224 36	BSD1	(8/10D)
X224 37	BSD0	(8/10D)
X224 38	BIOW	(8/10C)
X224 39	BIOR	(8/10C)
X224 40	BRESET	(8/10D)
X224 41	AUDIOIRQ	(8/10C)
X224 42		
X224 43		
X224 44		
X224 45		
X224 46		
X224 47		
X224 48		
X224 49		
X224 50		

CONNECTOR DEFINITIONS MB2

COMPONENT/PIN	SIGNAL	ON SHEET
MOTHERBOARD 1/2 CONNECTOR		
X213 1	MB2+5VREF	(17/2C,17/8B)
X213 2	+5.2V C233 10N	
X213 3		
X213 4		
X213 5		
X213 6		
X213 7	+12V	
X213 8		
X213 9	-12V	
X213 10		
X213 11		
X213 12	+8V	
X213 13		
X213 14		
X213 15	+28V	
X213 16		
X213 17		
X213 18		
X213 19	+12VSTANDBY (n.c.)	
X213 20		
X213 21		
X213 22	MB2DIAGNOSE	(17/2C,17/8C)
X213 23		
X213 24	MB2DEMODIN	(17/8C)
X213 25		
X213 26	MB2_H2AFGENMON	(17/8C)
X213 27		
X213 28	MB2ABISSYNCOUT	(17/2D)
X213 29		
X213 30	MB2XSPTXRDY	(17/2D)
X213 31	MB2XSPTXSFM	(17/2D)
X213 32	MB2XSPSP	(17/2D)
X213 33		
X213 34	MB2RFOCXO	(17/2D)
X213 35		
X213 36		
X213 37		
X213 38	+3.3V C234 10N	
X213 39		
X213 40		
X213 41		
X213 42		
X213 43	MB2_H1HANDSETIN	(17/8C)
X213 44	MB2_H1HANDSETOUT	(17/8C)
X213 45		
X213 46	MB2_H2HANDSETIN	(17/8C)
X213 47	MB2_H2HANDSETOUT	(17/8C)
X213 48		
X213 49	MB2_H1AFGENMON	(17/8C)
X213 50		

COMPONENT/PIN	SIGNAL	ON SHEET
MOTHERBOARD 1/2 CONNECTOR		
X214 1		
X214 2		
X214 3		
X214 4		
X214 5		
X214 6		
X214 7	MB2SCK1	
X214 8		
X214 9	MB2SC020	
X214 10	MB2SC010	
X214 11	MB2SC000	
X214 12		
X214 13		
X214 14		
X214 15		
X214 16		
X214 17		
X214 18		
X214 19		
X214 20		
X214 21		
X214 22		
X214 23		
X214 24		
X214 25		
X214 26		
X214 27		
X214 28		
X214 29		
X214 30		
X214 31		
X214 32		
X214 33		
X214 34		
X214 35		
X214 36		
X214 37		
X214 38	MB2BSD7	(17/5C)
X214 39	MB2BSD6	(17/5C)
X214 40	MB2BSD5	(17/5C)
X214 41		
X214 42		
X214 43		
X214 44		
X214 45		
X214 46		
X214 47		
X214 48		
X214 49		
X214 50		

AEND. IND	AENDERUNGS-MITTEILUNG	DATUM	NAME
01 00			

	DATUM	NAME
BEARB		KR
GEPR.		KR
NORM		
PLOTT	99-07-01	KRAETSCH

BENENNUNG: MOTHERBOARD

TOP/TOP 16

ROHDE&SCHWARZ

ZEICHN.-NR: 1100.0908.01 S

BLATT-NR: 31

ZU GERAET: CMU

ERSTE: 1100.0908.01

CONNECTOR DEFINITIONS MB2

COMPONENT/PIN	SIGNAL	ON SHEET
REFERENZ BOARD		
X101 A1	+5.2V	
X101 A2		
X101 A3		
X101 A4	+12V	
X101 A5		
X101 A6	−12V	
X101 A7		
X101 A8	+8V	
X101 A9		
X101 A10		
X101 A11		
X101 A12	+28V	
C235 10nF		
X101 B1	MB2+5VREF	(16/88,17/88)
X101 B2		
X101 B3		
X101 B4 R257 100	MB2DIAGNOSE	(16/8C,17/8C)
X101 B5		
X101 B6	MB2ABISSYNCOUT	(16/8C)
X101 B7	MB20PTOCXO1	(16/80)
X101 B8	MB20PTOCXO2	(16/80)
X101 B9	MB2SOCXO	(16/80)
X101 B10		
X101 B11		
X101 B12	MB2RFOCXO	(16/80)

COMPONENT/PIN	SIGNAL	ON SHEET
REFERENZ BOARD		
X101 C1	+5.2V Coding ADR 100..10F	
X101 C2		
X101 C3		
X101 C4		
X101 C5		
X101 C6		
X101 C7		
X101 C8	MB2BSA3	(16/11D,17/11B)
X101 C9	MB2BSA2	(16/11D,17/11B)
X101 C10	MB2BSA1	(16/11D,17/11B)
X101 C11	MB2BSA0	(16/11D,17/11B)
X101 C12	MB2REFAEN	(16/11C)
X101 D1		
X101 D2	MB2BSD7	(16/11D,17/11C)
X101 D3	MB2BSD6	(16/11D,17/11C)
X101 D4	MB2BSD5	(16/11D,17/11C)
X101 D5	MB2BSD4	(16/11D,17/11C)
X101 D6	MB2BSD3	(16/11D,17/11C)
X101 D7	MB2BSD2	(16/11D,17/11C)
X101 D8	MB2BSD1	(16/11D,17/11C)
X101 D9	MB2BSD0	(16/11D,17/11C)
X101 D10	MB2BIOW	(16/11D,17/11C)
X101 D11	MB2BIOR	(16/11D,17/11C)
X101 D12	MB2BRESET	(16/11D,17/11C)

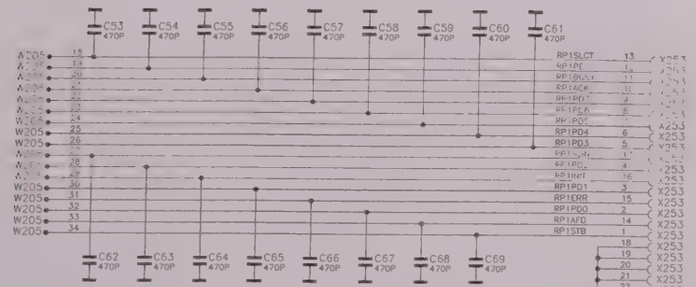
COMPONENT/PIN	SIGNAL	ON SHEET
AUDIO BOARD		
X111 A1	MB2+5VREF	(16/88,17/2C)
X111 A2		
X111 A3	−12V	
X111 A4		
X111 A5		
X111 A6	+5.2V C236 10N	
X111 A7		
X111 A8	+8V	
X111 A9		
X111 A10	+12V	
X111 A11		
X111 A12		
X111 A13	+28V	
X111 A14		
X111 A15		
X111 A16		
X111 A17	MB2LH1HANDSETIN	(16/8D)
X111 A18	MB2LH1HANDSETOUT	(16/8D)
X111 A19		
X111 A20	MB2LH2HANDSETIN	(16/8D)
X111 A21	MB2LH2HANDSETOUT	(16/8D)
X111 A22		
X111 A23	MB2LH1AFGENMON	(16/8D)
X111 A24	MB2LH2AFGENMON	(16/8C)
X111 B1		
X111 B2 R256 100	MB2DIAGNOSE	(16/8C,17/2C)
X111 B3	MB2DEMODIN	(16/8C)
X111 B4		
X111 B5	+5.2V	
X111 B6		
X111 B7		
X111 B8		
X111 B9	+3.3V C237 10N	
X111 B10		
X111 B11		
X111 B12		
X111 B13		
X111 B14	MB2RESHFCOUNT (n.c.)	
X111 B15		
X111 B16	MB2RESAFIN (n.c.)	
X111 B17		
X111 B18	MB2LH1RES1	(16/11C)
X111 B19	MB2LH1XSPTXRDY	(16/11C)
X111 B20	MB2LH1BSPBFI	(16/11C)
X111 B21	MB2LH1XSPSP	(16/11C)
X111 B22	MB2LH1BSPTXSFM	(16/11C)
X111 B23	MB2LH1PRISPTAF	(16/11C)
X111 B24		

COMPONENT/PIN	SIGNAL	ON SHEET
AUDIO BOARD		
X111 C1	+5.2V Coding ADR 130..13F	
X111 C2		
X111 C3		
X111 C4		
X111 C5		
X111 C6	+5.2V	
X111 C7	+5.2V	
X111 C8	MB2BSA0	(16/11D,17/5B)
X111 C9	MB2BSA1	(16/11D,17/5B)
X111 C10	MB2BSA2	(16/11D,17/5B)
X111 C11	MB2BSA3	(16/11D,17/5B)
X111 C12	MB2AUDIOAEN	(16/11C)
X111 C13		
X111 C14	MB2BRESET	(16/11D,17/5D)
X111 C15	MB2BIOR	(16/11D,17/5D)
X111 C16	MB2BIOW	(16/11D,17/5D)
X111 C17	MB2BSD0	(16/11D,17/5D)
X111 C18	MB2BSD1	(16/11D,17/5D)
X111 C19	MB2BSD2	(16/11D,17/5D)
X111 C20	MB2BSD3	(16/11D,17/5D)
X111 C21	MB2BSD4	(16/11D,17/5C)
X111 C22	MB2BSD5	(16/11D,17/5C)
X111 C23	MB2BSD6	(16/11D,17/5C)
X111 C24	MB2BSD7	(16/11D,17/5C)
X111 D1		
X111 D2	MB2SCK00	(16/11C)
X111 D3	MB2SRD00	(16/11C)
X111 D4	MB2STD00	(16/11C)
X111 D5	MB2SC000	(16/11B)
X111 D6	MB2SC010	(16/11B)
X111 D7	MB2SC020	(16/11B)
X111 D8		
X111 D9	MB2SCK10	(16/11B)
X111 D10	MB2SRD10	(16/11B)
X111 D11	MB2STD10	(16/11B)
X111 D12	MB2SC100	(16/11B)
X111 D13	MB2SC110	(16/11B)
X111 D14	MB2SC120	(16/11B)
X111 D15		
X111 D16	MB2AUDIOIRQ	(16/11D)
X111 D17	MB2PFCINT	(16/11D)
X111 D18	MB2LH2RES1	(16/11C)
X111 D19	MB2LH2XSPTXRDY	(16/11C)
X111 D20	MB2LH2BSPBFI	(16/11C)
X111 D21	MB2LH2XSPSP	(16/11C)
X111 D22	MB2LH2BSPTXSFM	(16/11C)
X111 D23	MB2LH2PRISPTAF	(16/11C)
X111 D24		

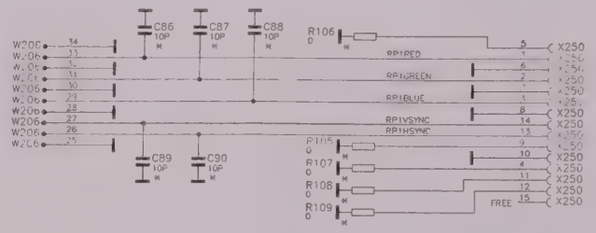
BEHALTEN WIR UNS ALLE RECHTE VOR

01.00				1CMK	DATUM	NAME	BENENNUNG		
				BEARB.		KR	MOTHERBOARD		
				GEPR		KR			
				NORM			TOP TOP 17		32
				PLOTT	99-07-01	KRAETSCH			
				ROHDE&SCHWARZ			ZEICHN.-NR 1100.0908.01 S		BLATT-NR
AEND IND	AENDERUNGS-MITTEILUNG	DATUM	NAME	ZU GERAET CMU			REG.I.V. 1100.0008	ERSTE Z 1100.0008.01	

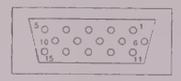
CONNECTOR DEFINITIONS REAR PANEL BOARD 1

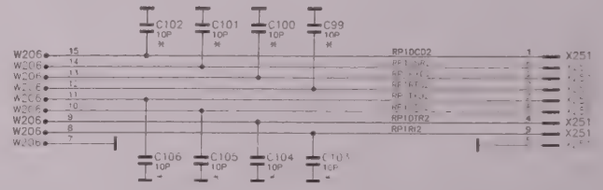


X253 LPT

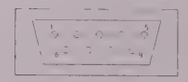


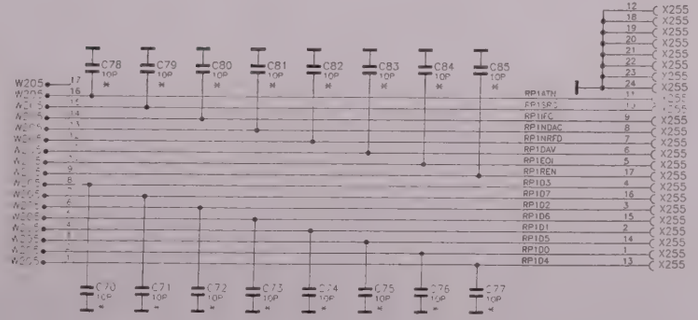
X250 MONITOR



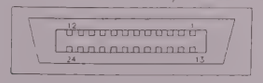


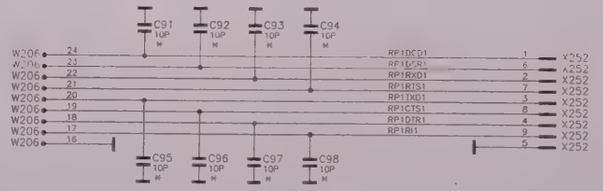
X251 COM2



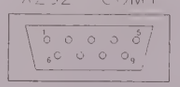


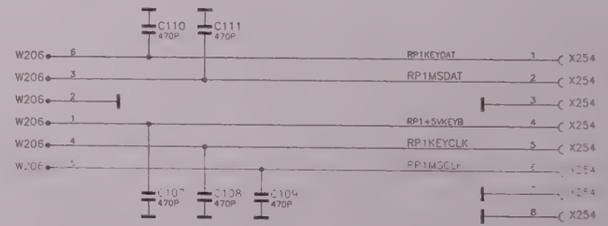
X255 IEC 625 / IEEE 488





X252 COM1





X254
KEYBOARD

01.00				1CMK	DATUM	NAME	BENENNUNG
				BEARB.		KR	MOTHERBOARD
				GEPR.		KR	
				NORM			
				P_OTT	99 07-01	KRAETSCH	TOP/TOP 18
				ROHDE&SCHWARZ			ZEICHN.-NR 1100.0908.01 S
AEND IND	AENDERUNGS-MITTEILUNG	DATUM	NAME	ZU GERAET CMU			REG.I.V. 1100.0008 ERSTE Z 1100.0008.51

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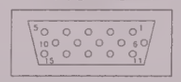
BLATT-NR 18

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

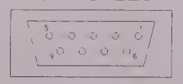
CONNECTOR DEFINITIONS FRONT PANEL BOARD

COMPONENT/PIN	SIGNAL	COMPONENT/PIN
MOTHERBOARD		
W219 1	FP+5VKEYB	(19/3E)
W219 2		
W219 3	FPLEDRF4IN	H11
W219 4	FPLEDRF3OUT	H12
W219 5	FPLEDRF2IN	H13
W219 6	FPLEDRF2OUT	H14
W219 7	FPLEDRF1IN	H15
W219 8	FPLEDRF1OUT	H16
		6 X HLMP1719
W219 9		C134 100P, C135 100P, C136 100P, C137 100P, C138 100P, C139 100P, C140 100P
W219 10	FPFUSEEXTTBUS1	X303 1
W219 11	FPFUSEEXTTBUS2	X303 2
W219 12	FPFUSEEXTTBUS3	X303 3
W219 13	FPFUSEEXTTBUS4	X303 4
W219 14	FPFUSEEXTTBUS5	X303 5
W219 15	FPFUSEEXTTBUS6	X303 6
W219 16	FPFUSEEXTTBUS7	X303 7
W219 17	FPFUSEEXTTBUS8	X303 8
W219 18	FPFUSEEXTTBUS9	X303 9
W219 19	FPFUSEEXTTBUS10	X303 10
W219 20	FPFUSEEXTTBUS11	X303 11
W219 21	FPFUSEEXTTBUS12	X303 12
W219 22	FPFUSEEXTTBUS13	X303 13
W219 23	FPFUSEEXTTBUS14	X303 14
		X303 15
		C141 100P, C142 100P, C143 100P, C144 100P, C145 100P, C146 100P, C147 100P
W219 24		C148 470P, C149 470P, C150 470P, C151 470P, C152 470P
W219 25	FPLH1HANDSETIN	X304 1
W219 26	FPLH1HANDSETOUT	X304 2
W219 27		X304 3
W219 28	FPLH2HANDSETIN	X304 4
W219 29	FPLH2HANDSETOUT	X304 5
W219 30		X304 6
(19/2A)	FP+5VKEYB	X304 7
		X304 8
		X304 9
		X305 SMB-ST
		X306 SMB-ST
		X307 SMB-ST
		X308 SMB-ST
		C112 10P *, C113 10P *, C114 10P *, C115 10P *

X303 AUX3



X304 SPEECH



COMPONENT/PIN	SIGNAL	COMPONENT/PIN
MOTHERBOARD		
W219 31	FPLH1DCDA	C116 470P, C117 470P, C118 470P, C119 470P, C120 470P; X301 1
W219 32	FPLH1DSRA	X301 6
W219 33	FPLH1RXDA	X301 2
W219 34	FPLH1RTSA	X301 7
W219 35	FPLH1TXDA	X301 3
W219 36	FPLH1CTSA	X301 8
W219 37	FPLH1DTRA	X301 4
W219 38	FPLH1RIA	X301 9
W219 39	FPLH1GND	X301 5
W219 40	FPLH1SERVGND	C121 470P, C122 470P, C123 470P, C124 470P
W219 41	FPLH2DCDA	C125 470P, C126 470P, C127 470P, C128 470P, C129 470P; X302 1
W219 42	FPLH2DSRA	X302 6
W219 43	FPLH2RXDA	X302 2
W219 44	FPLH2RTSA	X302 7
W219 45	FPLH2TXDA	X302 3
W219 46	FPLH2CTSA	X302 8
W219 47	FPLH2DTRA	X302 4
W219 48	FPLH2RIA	X302 9
W219 49	FPLH2GND	X302 5
W219 50	FPLH2SERVGND	C130 470P, C131 470P, C132 470P, C133 470P

X301 DATA1

X302 DATA2

UEBER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

AEND NO	AENDERUNGS MITTEILUNG	DATUM	NAME
01.00			

	ICM	DATUM	NAME
BEARB			KR
GEPR.			KR
NORM			
PLOTT	99-02-01		KRAETSCH

ROHDE&SCHWARZ

ZUGERAET CML

BENENNUNG
MOTHERBOARD

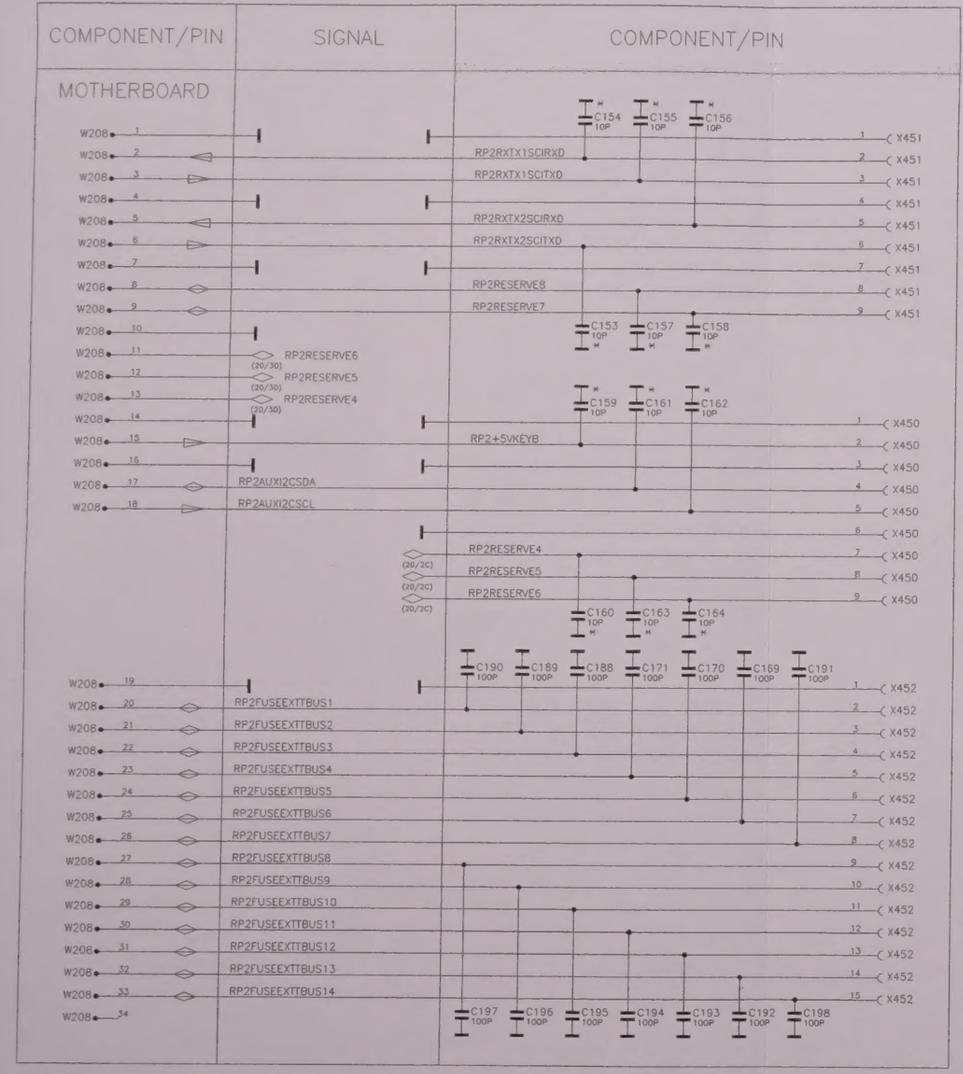
TOP/TOP 19

ZEICHN.-NR. 1100.0908.01 S

BLATT-NR. 34

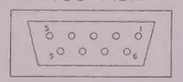
REG I V 1100.0008 | ERSTE Z. 1100.0008.01

CONNECTOR DEFINITIONS REAR PANEL BOARD 2

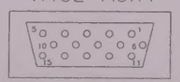


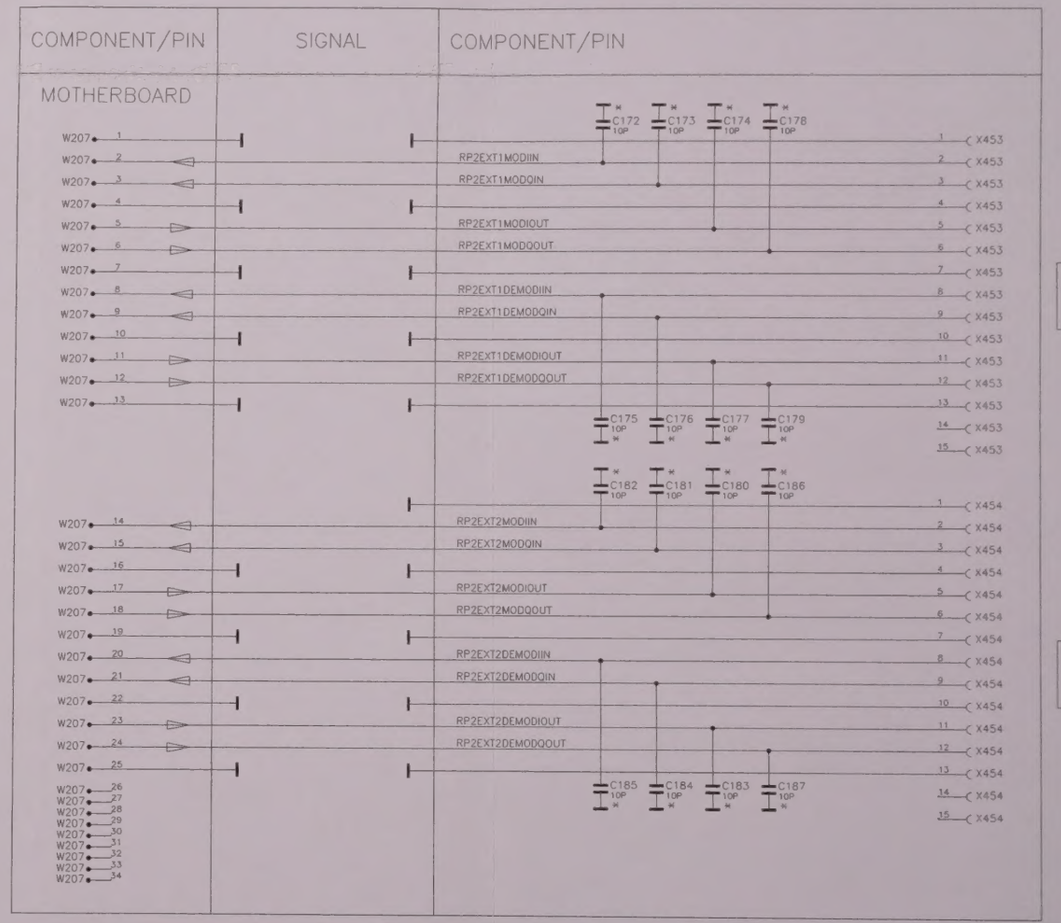
X451 SERVICE

X450 AUX

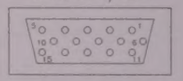


X452 AUX4

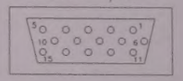




X453 I/Q 1



X454 I/Q 2



01.00				1CMK	DATUM	NAME	BENENNUNG
				BEARB.		KR	MOTHERBOARD
				GEPR.		KR	
				NORM			TOP/TOP.20
				PLOTT	99-07-01	KRAETSCH	ZEICHN.-NR. 1100.0908.01 S
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			BLATT-NR. 20 - 35
				ZU GERAET CMU			REG.I.V. 1100.0008 ERSTE Z. 1100.0008.01

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

MP MASTER
MA25749